Implications of the Syrian Refugee Influx on the Jordanian Labor Market

Trends Analysis across Jordan's Twelve Governorates, 2007-2014

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Foreword & Acknowledgements

I went to Jordan for the first time in 2010 to study Arabic at the University of Jordan. During that time, I learned about the Palestinian refugee crisis and came to understand Jordan as a country with a rich heritage of welcoming refugees. I returned in 2014 and observed an environment of tension regarding the growth of the Syrian population since the conflict broke out in Syria in 2011. I visited camps in Mafraq and Marka and was overwhelmed by the magnitude of the crisis, so much so that it finalized my decision to apply for a Master's program to develop skills to evaluate the international aid response to the crisis and support the search for effective strategies to reconstruct livelihoods for communities who have lost everything in the wake of war.

As I complete the requirements for my Master's degree with this 30-some page paper on the livelihoods of Syrian refugees in Jordan, I am awed and grateful in recognition of the support I have received at the Humphrey School to accomplish the dreams that brought me here in the first place. I owe a great deal to Dr. Deborah Levison for her faithful advising, constant encouragement and rigorous instruction. She sets the bar high for her students and I, for one, grew immensely as a student and as a human while stretching to reach it. Similarly, my experience at Humphrey would not have been half as fulfilling without the opportunity to study and research under the supervision of Dr. Ragui Assaad. Dr. Ragui invited me with enthusiasm into his broad base of knowledge and experience in quantitative approaches to the challenges facing communities in the Middle East and North Africa. I would not be where I am today without his mentorship.

I had few personal experiences with suffering until my dad died suddenly in an accident in the spring semester of my first year at Humphrey. As it turned out, this loss and the grief that followed added depth and meaning to my research on refugee communities. I dedicate this paper to my dad, for making me strong with his presence and even stronger in his absence.

Table of Contents:

1 Introduction

- 1.1 Vulnerability
- 1.2 Key Features of the Study

2 Context and Literature Review

- 2.1 The Conflict in Syria
- 2.2 The Jordanian Context
  - 2.2.1 Legal Framework for Refugees in Jordan
  - 2.2.2 Characteristics of the Jordanian Labor Market
- 2.3 Literature Review: Syrian Refugees in Jordan

3 Data Backgrounder

- 3.1 Approximations for Proportion Syrian by Governorate
- 3.2 Proportion Syrian as a Treatment Variable
- 3.3 Household Characteristics

4 Analysis of Labor Market Trends

- 4.1 Labor Supply: Effects at the Extensive Margins
- 4.2 Informal Labor Supply: Effects at the Intensive Margins
  - 4.2.1 Informal Private-Wage Work
  - 4.2.2 Weekly Working Hours
  - 4.2.3 Monthly Income

5 Implications and Conclusions:
Addressing Short-Term Vulnerabilities and Facilitating Long-Term Growth

- 5.1 Implications of Underemployment
- 5.2 Innovating Labor Market Growth
- 5.3 Recommendations for Further Study

1 Introduction

The Syrian civil war has displaced over 10 million Syrians from their homes since its inception in 2011. While 5 million displaced Syrians remain without a home inside their own country, the other 5 million have fled for refuge in countries far and near, including Turkey, Lebanon and Jordan. For a small country like Jordan, whose pre-conflict population size was about 6 million people, the arrival of 1 million refugees has come as a major shock to the nation's economy and society. While many commentators and analysts hope for a resolution to the conflict that includes the return of refugees to their Syrian homes (Yahya 2017), the prospect of that reality coming to fruition is bleak at best. Even if a peace settlement is possible in Syria, the Assad regime and the Islamic State have left a legacy of utter destruction. What is left of the ravaged country has been rigged for further explosion. A recent report from the Economist documents the presence of land-mines and booby-trapped homes, schools, hospitals and mosques, making the nation "one of the most heavily mined regions on earth" (Economist 2017). The process of mine-sweeping and rebuilding Syria will be extraordinarily expensive and will take decades (Economist 2017). Jordan and other host countries must treat their new population of Syrian refugees as new permanent residents, as this is the most likely outcome for the present generation, and find a way to make the most of their presence.

If Jordan is to treat Syrians as a new permanent population, it must also prioritize initiatives to integrate Syrian workers into the labor market. This paper investigates labor market trends for Jordanians, Syrians and Egyptians in the years just before and just after 2011, when the first wave of Syrian refugees arrived in Jordan. The analysis will examine

trends across the 12 administrative divisions in Jordan, called governorates, and across three categories of governorates by proportion-level Syrian.

Using a vulnerability frame, I seek to identify the populations whose livelihoods have been most affected by the influx of refugees and explore dimensions of the nature and extent of the effect. I examine the experiences of the three main nationality groups living and working in Jordan: Jordanians, Egyptians and Syrians. Precedent studies have classified the labor market strains of the Syrian influx as rising unemployment and declining wage rates in Jordanian host communities. My results confirm the existence of influx-induced strains on employment opportunities and wages in Jordan, but they provide evidence for an alternative story to the popular one in the current literature. There are two main elements to the alternative story. First, the primary group for whom Syrians constitute a substitute for labor are other non-Jordanians, mostly Egyptian male temporary migrant workers, which has served to offset some of the potentially negative effects of the influx on Jordanian communities. Second, the effects of the influx on the local population have been concentrated in a specific sub-sector of the labor market: private-wage workers in largely informal occupations. Among workers in the informal private sector, the influx of refugees has led to underemployment in the form of decreased weekly working hours and, consequently, increasing proportions of households in this group living on below-poverty monthly wages.

1.1 Vulnerability

The United Nations (UN), the World Bank (WB), and other Non-Governmental Organizations (NGOs) and research institutions have adopted vulnerability frameworks to analyze welfare and poverty. Vulnerability is a more complex notion than poverty, as it

includes an analysis not only of poor conditions in the present, but also of present risk of future "deterioration in circumstances or achievements." (United Nations Development Program (UNDP) 2014; WB 2016). Embedded in the vulnerability framework is the capabilities approach to development, which proposes that "social arrangements should be primarily evaluated according to the extent of freedom people have to promote or achieve the functionings they value" (Oxford 2013). Vulnerability is often measured by an individual or household's ability to withstand exogenous shocks. Shocks may be idiosyncratic, such as an expensive illness or loss of a job, or structural, such as a national recession or sudden population influx (UNDP 2014). The main goal of this study is to explore the nature and extent of structural vulnerabilities brought on by the refugee crisis for communities living in Jordan.

1.2 Key Features of the Study

The study uses Jordan's Employment and Unemployment Surveys (EUS) from 2003-2014 with the aim to analyze trends in labor market indicators at the governorate level. Using the proportion of Syrians in each governorate, I classify governorates into three categories of "treatment": low, medium, and high. This treatment variable will be examined against labor market outcomes including labor force participation, unemployment, weekly working hours and wages. The pre- and post-treatment periods are separated by the year 2011, when the first wave of Syrians entered Jordan, though this is not a sharp cut-off. These periods will be referred to as *pre-influx* and *post-influx*.

2 Context and Literature Review

2.1 The Conflict in Syria

In 1943, after 30 years of a French mandate, Syria achieved independence. The newborn nation suffered immense political instability in its first two decades of independence. In 1970, the presiding Defense Minister, Hafez al-Assad, led a successful military coup and established the regime that has held power for the last 47 years (Cleveland & Bunton 2009). When Hafez al-Assad passed away in 2000, Bashar al-Assad succeeded his father and continued the authoritarian legacy of the al-Assad family regime.

In the spirit of the revolutionary fervor that spiraled across the Middle East in late-2010 and early 2011, a phenomenon now commonly referred to as the "Arab Spring", Syrian citizens took to the streets in protest of al-Assad's rule. As the resistance strengthened, Assad began to use force to quiet the opposition; his tactic elicited the opposite effect. After Assad's military opened fire on a group of demonstrators in March 2011, nationwide protests erupted calling for Assad to resign his post. By the end of 2011, the country had descended into a violent civil war: an armed stand-off between the administration and a rebel faction named the "Free Syrian Army" (Zorthian 2015). Damascus, the Syrian capital, and areas bordering Lebanon became the stronghold cities for Assad and his forces. The retreat of Assad left a vacuum of power that invited the participation of other actors, most notably the Al-Qaeda off-shoots of the Islamic State (IS) and the al-Nusra Front (Zorthian 2015). The Free Syrian Army and other armed rebel groups including Kurdish tribes combined to form the Syrian National Coalition, which is the party to the conflict that has been supported by international aid (Zorthian 2015).

Since it began, the conflict has killed at least 470,000 Syrians and displaced over half of the country's population. Almost 5 million Syrians have fled the country, seeking refuge in neighboring countries and, in some cases, far-off countries (Syrian Center 2017).

Another 6 million are internally displaced in Syria. The entire nation is ravaged and its wounds are seeping across its borders.

2.2 The Jordanian Context

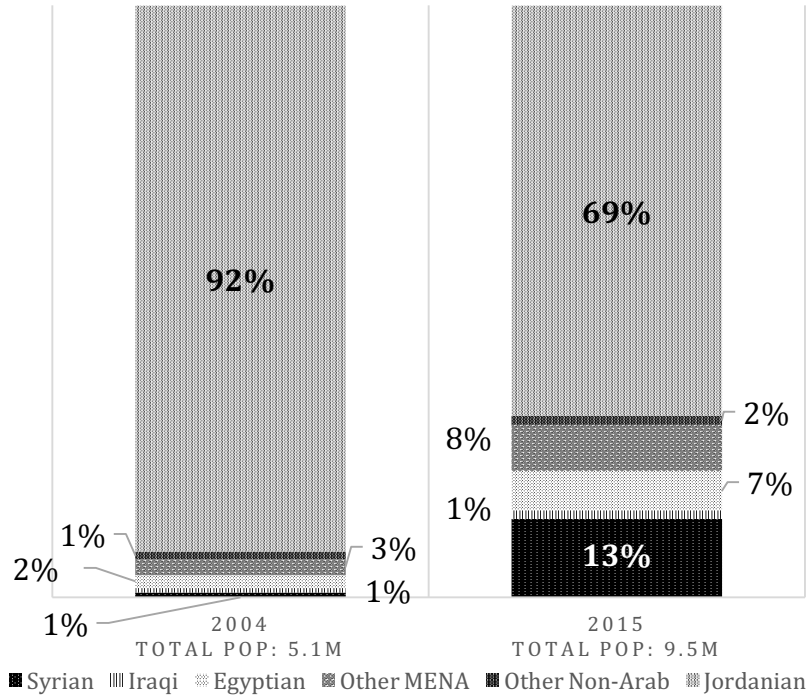
The Hashemite Kingdom of Jordan is a small country south of Syria that grew from 5 million in 2004 to almost 10 million in 2015. Much of this population growth has happened in the post-2011 period, as Jordan has been a primary receiving country for Syrians displaced by conflict. Jordan has a rich history of welcoming refugees. Jordan received 500,000 Palestinian refugees from the West Bank and the Gaza Strip after the creation of the State of Israel in 1948, which accounted for a full third of Jordan's population at the time (Chatelard 2010). The Arab-Israeli war of 1967 sent another 400,000 Palestinians into Jordan (Chatelard 2010). Most Palestinians living in Jordan have become Jordanian citizens and are fully integrated into mainstream Jordanian life, society, culture and work (United Nations Reliefs and Works Agency [UNRWA] 2016). A smaller proportion, mostly composed of Palestinians from the Gaza Strip, lack citizenship and still live in refugee camps scattered across the country (UNRWA 2016). In addition to refugees from the West Bank and Gaza Strip, Jordan also received Lebanese refugees during the 1975-1991 civil war, Palestinian refugees that were living in Iraq during the 1991 Gulf War and Iraqi refugees in the years following the U.S. invasion of Iraq in 2003 (Chatelard 2010). By 2007, some 450,000 to 500,000 Iraqis had made a home in Jordan (Fafo 2007). In 2015 Iraqis composed about 1% of Jordan's population (Jordan Department of Statistics 2015).

Jordan is a constitutional parliamentary monarchy, whose original constitution was written in 1947 and has been amended several times since (Central Intelligence Agency 2017). The legal system is a composite of codes from the Ottoman era, British common law,

and Islamic law. Jordan is divided into 12 administrative governorates of varying sizes, classified regionally as north, central or south, with four governorates in each regional bloc. Two governorates, Irbid and Mafraq, border Syria with an additional two that compose the northern region of the country: Ajloun and Jerash. The central region includes Zarqa, Balqa, Madaba and Amman, which is the capital and has the largest population. The four governorates in the southern region of the country are Karak, Tafileh, Maan and Aqaba.

Citizenship in Jordan does not come by birth, unless the child's father is a citizen of Jordan. All others must be naturalized citizens, which requires 15 years of residency. In the 2004 Census, Jordan's population was about 5.1 million, 91% of whom were Jordanian citizens. By the time of the 2015 census, the population had grown to 9.5 million inhabitants, of whom 70% or about 6.6 million were Jordanian citizens (Fig. 1).

Figure 1. Jordan's Population Composition, 2004 and 2015



Source: Jordan Department of Statistics, Housing and Population Census, 2004 & 2015
http://www.dos.gov.jo/dos_home_e/main/population/census2015/index.htm

Syrians, who made up less than 1% of the total population in 2004, constituted 13.3% of the total population by 2015 (Jordan Department of Statistics 2016). The 2015 Census counted 1.27 million Syrians living in Jordan and classified 953,289 of them as refugees, though the United Nations High Commissioner for Refugees (UNHCR) had registered around 650,000 at the time. Of the Syrian refugees currently living in Jordan, 20% are living in camps and 80% live in urban host communities (UNHCR 2017a).

As is often the case in the aftermath of a conflict-induced refugee crisis, the challenges of population increase are immediately visible in the short-term, while potential benefits take time to unfold (Errighi and Griesse 2016). The conflict in Syria has had negative spillover effects in the short-term for the regional macroeconomic environment in Jordan. These include a disruption in trade and commerce, a downturn in profits from the tourism industry, and reduced capital inflows (International Monetary Fund 2015). Jordan's annual growth rate has dipped to an average of 2.8% between 2011-2014, compared to an average of 6% in the years preceding the influx of Syrian refugees. These trends have not been empirically linked to the conflict. An unpublished paper by the Jordanian administration estimated direct and indirect costs incurred to the nation of Jordan by the conflict in Syria at USD 6.6 billion from March 2011 to December 2015 (Errighi and Griesse 2016). The report does not break down this figure between refugee-related and conflict-related costs, but in annual terms, the figure represents about 3-4% of Jordan's GDP (World Bank 2017).

2.2.1 Legal Framework for Refugees in Jordan

Jordan is not a signatory to the 1951 United Nations (UN) Geneva Convention on Refugees, which is the legal framework that establishes international rights for refugees

and asylees and requires signatory states to protect the rights of the refugees that arrive at their doors. Refugee policy in Jordan is governed by the "Alien Law" in the Jordanian Constitution, which requires refugees and political asylum seekers to apply for official refugee status at a local police station within 48 hours of entering the country (Sadek 2013). The law further grants authority to the Minister of the Interior to determine whether applicants can remain in the country, but does not identify the stipulations for eligibility (Sadek 2013). However, under its commitment to the 1991 Convention against Torture, Jordan cannot force the return of asylees to a place where they face danger of torture (UN 2017). Some have been turned away at the border, at which point they may seek refuge in a different surrounding country or, more likely, they will find an unofficial entry point to Jordan (World Bank 2016).

Only Syrians who entered Jordan after January 2012 are eligible for registration with UNHCR (Relief Web 2013). The official method of registration, which happens in tandem with UNHCR registration processes, suits Syrians who enter Jordan at formal border crossings and have proper identification and travel documents. Those without proper identification find unofficial entry points and circumvent registration processes, to avoid denial of entry (Relief Web 2013). Some groups of refugees from Syria, namely Palestinian or Iraqi refugees living in Syria and military-age single men, may altogether avoid official border crossings because Jordan regularly denies entry to these groups (Frelick 2013, UNICEF 2013). Still others avoid registration because they fear that Jordan or the UN will report their personal details back to Syria, endangering family members remaining in Syria (Relief Web 2013). Unregistered Syrians live outside of refugee camps and do not have access to public health services, education, food voucher programs, cash

assistance or work authorization (Relief Web 2013). An imperfect estimate of unregistered Syrian refugees in Jordan is around 300,000, which is the difference between the 953,289 Syrian refugees counted in the census and the 658,015 refugees formally registered with UNHCR (UNHCR 2017).

Registered refugees with legal residency permits and valid identification can work if they have a permit from the Ministry of Labor (MoL), but permits are in short supply and are difficult to obtain. Obtaining a work permit requires a fee from the employer, which usually ends up being paid by the worker, and proof that the skillset or experiences required for the job are lacking in the Jordanian workforce (Relief Web 2013). Further, the Ministry of Labor officially prevents the employment of Non-Jordanian workers in a list of specific occupations.[1] Consequently, most refugees, both registered and unregistered, find informal work that they can do without a work permit. In 2014, the Ministry of Labor reported that 5,700 Syrians, which is less than 1% of all working-age Syrian refugees in Jordan, had obtained work permits (MoL 2014). Presumably, the rest were working informally in Jordan.

2.2.2 Characteristics of the Jordanian Labor Market

Jordan is a labor-sending country for high-skilled workers and a labor-receiving country for low-skilled workers. Highly educated and highly skilled Jordanians face limited job opportunities at home. Consequently, many high-skilled Jordanians choose to work abroad, mostly in the Gulf states, and send back portions of their income to their families in Jordan (Wahba 2011). When the pattern of out-migration began in the 1960s, the

[1] The list is as follows: medical, engineering, administrative and accounting, clerical, communications (switchboard and telephones), warehouse work, sales, haircutting, teaching, fuel sales, electricity, mechanical and car repair, driving (taxis), guards and servants (Ministry of Labor 2016)

government of Jordan saw it as an opportunity for obtaining a steady stream of financial revenue (Olwan 2010). A national development objective in the 1970s established a system of education for export, in which Jordanians were trained to work abroad (Chatelard 2010). Emigrant remittances drove the growth that Jordan experienced in the 1970s and 1980s (Wahba 2011). The Gulf War in 1991 led to a period of forced return of Jordanian workers, causing remittances to drop significantly, but it was not long before the channel re-opened (Chatelard 2010). Remittances from Jordanians working abroad accounted for about 20% of the Kingdom's Gross National Product in 2010 (Olwan 2010).

Growth in investment from foreign worker remittances in the 1970s and 1980s led to a surge in demand for labor in agriculture, construction and service sectors (Chatelard 2010). At the time, Jordan did not have the supply of labor to match the demand. To address the imbalance, Jordan began a policy campaign to attract low-skilled and semi-skilled laborers from surrounding countries (Chatelard 2010). The policies created to encourage labor immigration also segmented the labor market into occupations open to non-Jordanians and occupations closed to non-Jordanians (section 2.2.1). Primarily, migrant workers in Jordan are from Egypt and Southeast Asia. In the mid-1980s, 80% of all foreign workers were Egyptian. In the same period, Egyptians made up 87% of all agricultural workers (Chatelard 2010). From 2005-2014, Egyptians made up between 50%-70% of the non-Jordanian workforce, increasing from 2005-2011 and decreasing in the post-influx period as the Syrian population grew (Fig. 2). At the peak in 2011, Egyptians composed 70% of the non-Jordanian workforce and 20% of the total workforce in Jordan (Fig. 2). Prior to the influx of Syrians, the second largest group of non-Jordanian workers

were “other Arabs”, a category that primarily captures the Palestinian refugees from Gaza that have not obtained citizenship (Fig. 3).

The segment of the labor market dominated by foreign workers is characteristically informal, where jobs are provided by private sector entrepreneurs who rely on cheap labor to maximize profits (Chatelard 2010). Educated Jordanians almost exclusively search for work in the public sector and the formal private sector, where minimum wage laws are enforced and employees receive social insurance and pension plans (Myyran 2014). Most of the jobs in the public and formal-private sector are on the Ministry of Labor’s list of occupations closed to non-Jordanians. Informal private-wage work is identifiable in that it usually lacks social benefit packages such as pensions, sick pay and health insurance (International Labor Organization(ILO) 2017). It also lacks other forms of protection from poor working conditions, compulsory overtime, lay-offs or non-payment of wages to employees (ILO 2017). Another common identifier of informal work is when the size of the establishment in which work takes place has fewer than 10 employees (Assaad 2014).

Jordanians also participate in the informal private-wage sector, though at lower rates than non-Jordanians, as it is usually just those who have below high-school education or were early retirees from the public sector (Al Hawarin 2014). Early retirees from the public sector will often return to the workforce because they need the additional income, but stand to lose their public pensions if they return to a formal work position, so they settle for informal jobs (Al Hawarin 2014). A recent report by the United Nations Development Program (UNDP) estimated that the informal economy accounts for approximately 44% of Jordan’s GDP (2013b).

Figure 2. Non-Jordanians as a Proportion of the Male Labor Force, EUS 2005-2014

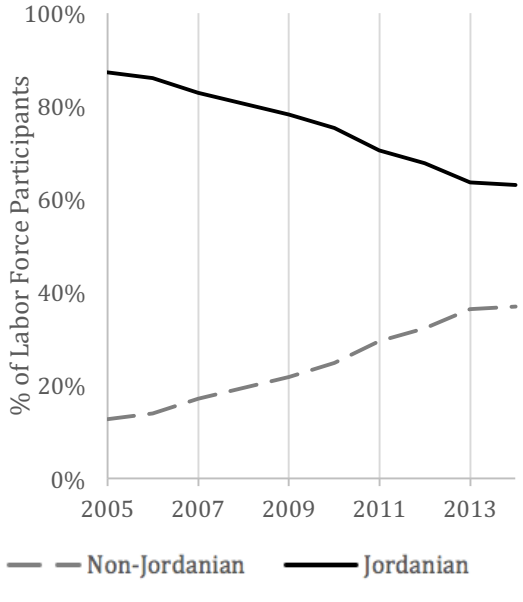
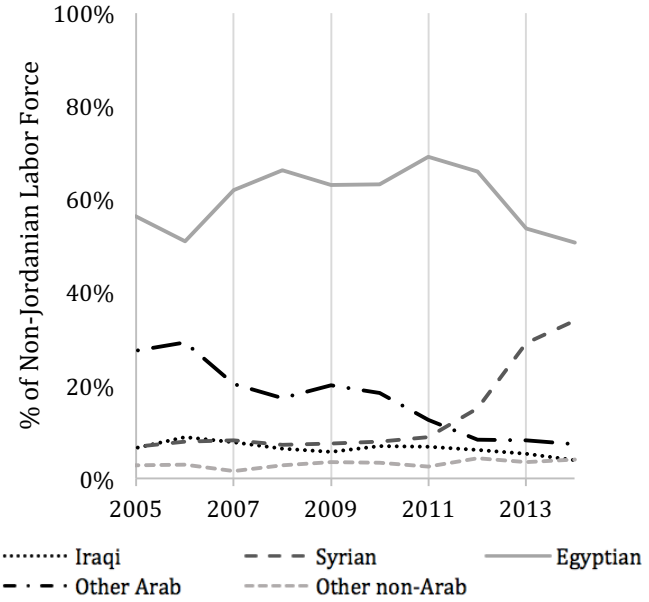


Figure 3. Composition of the Male Non-Jordanian Labor Force by Nationality, EUS 2005-2014



Sources for Figs. 2-3: OAMDI 2005-2014

Jordan's labor market is also segmented along gender lines. It has been well established that Jordan has one of the lowest labor force participation rates for women in the world (Kalimat and Al-Talafha, 2011; Mryyan 2012). Jordanian females participate in the labor market at very low rates, with between 10% and 30% of women between the ages of 15-64 as active participants across the 12 governorates from 2007-2014. Women made up about 15% of all labor force participants in Jordan in 2014 (OAMDI 2014). The barriers to the growth of female labor force participation and employment in Jordan are largely structural and thus are not likely exacerbated by the refugee influx. The structural reasons are outside the scope of this paper, but are generally due to the gendered nature of the Jordanian economy. Females predominantly obtain degrees in education and health fields; jobs in these fields are found in the public sector and have been in limited supply since the mid-1980s (Assaad, Hendy and Yassine 2014). Even when women have the right

skills or qualifications, they struggle to obtain private sector jobs because of insufficient support for maternity leave (Assaad, Hendy and Yassine 2014). Further, newly arrived Syrian females participate in the Jordanian labor market at even lower rates than Jordanian females, between 1% and 5% across the years 2007-2014, so are not likely to constitute a source of competition for jobs (OAMDI 2014). Therefore, implications of the Syrian refugee influx on Jordan's labor market are best assessed by examining trends among males.

The breakdown of the Jordanian male workforce by employment status has remained stable from 2007-2014 and across the 12 governorates. University-educated Jordanians suffer from the highest unemployment rates of all, due to the inability of the formal employment sector to keep pace with growth in educational attainment (Mryyan 2014). Labor demand in Jordan is still largely oriented towards individuals with less than secondary education, which constitutes 60% of the Jordanian workforce (Mryyan 2014). About 80-90% of the workforce are wage-workers (Fig. 8A), 4-10% are self-employed, 3-8% are employers and a residual proportion are either unpaid or unclassified workers (OAMDI 2007-2014). Individuals in the fourth category are usually those who work in a family business for no pay (Assaad 2014). Between 90%-100% of employed Egyptians are wage-workers across the years 2007-2014 and around 90% of employed Syrians in the post-influx period are wage-workers (Fig. 8A). Few Egyptians and virtually no Syrians work as employers and a small fraction, mostly in Amman, are self-employed.

2.3 Literature Review: Syrian Refugees in Jordan

Recent studies have observed empirically that the refugee influx has led to immense strains on host communities in Jordan, by forcing further distribution of already scarce public resources, services and job opportunities. Several studies have been conducted to

assess the social and economic impact of the influx of Syrians on host communities in Jordan. Some have focused on identifying the nature of social and economic tensions emerging from the increased strain on resources following the influx (Mercy Corps 2013; REACH 2014a, 2014b, 2015, World Vision 2015). These reports focus heavily on the social conflict that is emerging over competition for access to affordable housing, education and income-generating opportunities (REACH 2014). Others focus more on measuring the strain on the local labor market in terms of unemployment and wage rates (ILO 2015a; Stave and Hillesund 2015; Errighi and Griesse 2016).

The literature on social cohesion between refugees and host communities frame the post-influx strain on public resources as creating a zero-sum game between refugees and locals. In 2014, the UNHCR published the results of a needs assessment conducted across 160 communities "at risk for high levels of tension and/or insecurity" in the Northern and North-Central governorates of Jordan (REACH 2014a).[2] A previous phase of the study identified high-risk communities as those whose informants responded in the affirmative when asked whether the presence of Syrians has caused tension in their community (REACH 2014a). The study discovered two main sources of tension in high-risk communities: competition for employment and housing (REACH 2014a, 2014b).

A qualitative study conducted by the Mercy Corps in Jordan also found evidence that the resentment between refugees and host communities goes both ways (Mercy Corps 2013). Jordanians perceive Syrians as more well off in some circumstances because they receive cash and food assistance from NGOs and are thus able accept wages at a lower rate than the pre-influx minimums, which in turn lowers wages for Jordanians (Mercy Corps

[2] Ajloun, Irbid, Jerash, Mafraq, Balqa and Zarqa.

2013). Syrians, on the other hand, feel that employers exploit their vulnerability and desperation for work and have no choice but to accept the low wages, since aid from NGOs is not sufficient income to support their families (Mercy Corps 2013).

Studies documenting the labor market impacts of Syrian refugees in Jordan are heavily influenced by traditional economic models of labor supply and demand. In the traditional Immigration Surplus Model, a refugee influx immediately increases the size of the workforce, representing an outward shift in the supply curve that is assumed to be perfectly inelastic (Borjas 1995). Since capital is fixed in the short-run, the supply curve shifts out against a frozen labor demand curve. Using the equation for the wage rate, it can be shown that the short-run price elasticity of labor is negative (Borjas 2015). This means wages are expected to decrease in the short-run when there is an immediate increase to the labor supply. It follows from theory that Syrians might be more willing than Jordanians to take the lowest-paying jobs and therefore beat out the local competition in the low-wage job market. The accompanying implication is that the increase in labor supply contributes to rising unemployment among Jordanian nationals.

A 2015 study on labor market impacts of Syrian refugees in Jordan sponsored by the International Labor Organization (ILO) and Fafo concluded that the influx of Syrians has led to increased unemployment among Jordanians, higher competition for existing low-wage jobs, and a future threat of crowding-out in certain sectors, especially construction and services, as Syrian participation rates increase (Stave and Hillesund 2015). Their project sampled communities in three governorates with high proportions of Syrians: Mafraq, Irbid and Amman. Stave and Hillesund's findings were later supported by a European Commission (EC) study (Errighi and Griesse 2016).

The EUS data I analyze in section 4 does not corroborate the story that the arrival of Syrians has resulted in rising unemployment for Jordanians. The ILO and EC studies are not nationally representation and do not consider the reality that the Jordanian labor market is highly segmented along nationality lines. The segmentation of the labor market along nationality lines provides a unique insight for why the short-term effects of the Syrian influx on Jordanian labor market trends have not been as extreme as traditional economic models might suggest. A minority of employed Jordanians, less than 30% on average across the nation and as low as 10% in some governorates, work in the jobs where Syrians constitute a competitive labor substitute (EUS 2007-2014) Since Jordan's labor market already relied heavily on migrant labor in the jobs where Syrians are now looking for work, Jordanians themselves have been largely insulated from the shock to the labor supply. If migrant workers find themselves replaced by Syrians, they are more likely to return home than to remain unemployed. In this way, the Jordanian labor market has a built-in shock absorption mechanism. A more accurate picture of the localized effects of Syrians on the Jordanian labor market should consider outcomes in the informal private-wage sector, with a focus on how other non-Jordanian communities are faring.

3 Background on Jordan's Employment and Unemployment Survey Data

3.1 Approximations for Proportion Syrian by Governorate

The Jordan EUS is a quarterly survey collected by the Department of Statistics (DoS) of the Hashemite Kingdom of Jordan. In 2014, the four survey rounds covered a total sample of 53,000 households nation-wide using a stratified multi-stage cluster sampling frame. The survey's sample size from 2007-2014 ranged from 216,000 to 265,000

individuals (Appendix A, Table A1).[3] The primary objectives of this survey are to identify demographic, social and economic characteristics of the country's population. To this end, the survey examines occupational structure and economic activity of employed persons as well as the nature and reasons for unemployment and labor force inactivity. The Department of Statistics also conducts a national population census roughly every 10 years.

The EUS sample frame is based on populations counted in the 2004 census, when the non-Jordanian population was quite small, and consequently under-represents the foreign national groups not enumerated in 2004. Another cause of under-sampling of foreign populations in EUS is that the EUS sampling strategy focuses on those residing in regular households rather than in collective residential units, which is the most common living situation for economic migrants (Assaad 2014). Table 1 below shows the under-counting of Syrians in the EUS, by governorate, as compared to the Census counts. EUS does pick up on the increase in the proportion of Syrians in the kingdom, by governorate. However, it underestimates the presence of Syrians. Comparing percentages in columns 4 and 6 in Table 1, EUS estimates capture only 41% of the actual number of Syrians in the population as reported in the 2015 Census.

To draw insight about potential linkages between the Syrian refugee influx and changes in the labor market at the local governorate level, the study requires reliable estimates of the Syrian population in each governorate across years 2004-2015. To obtain accurate estimates, I calculated nationality-specific weights using census data. See Appendix B for a full explanation the weight calculation methodology. The integrity of the

[3] The primary group analyzed in this paper are informal private-wage working males. N in this category ranged from 10,000-12,000 between 2007-2014. See Appendix A, Table A2.

weighting methodology relies on the proximity of 2014 estimates to the 2015 actual proportions, shown in Columns 5 & 6 of Table 1.

Table 1. Comparison of Proportion Syrian in Census and EUS with original and census-adjusted weights

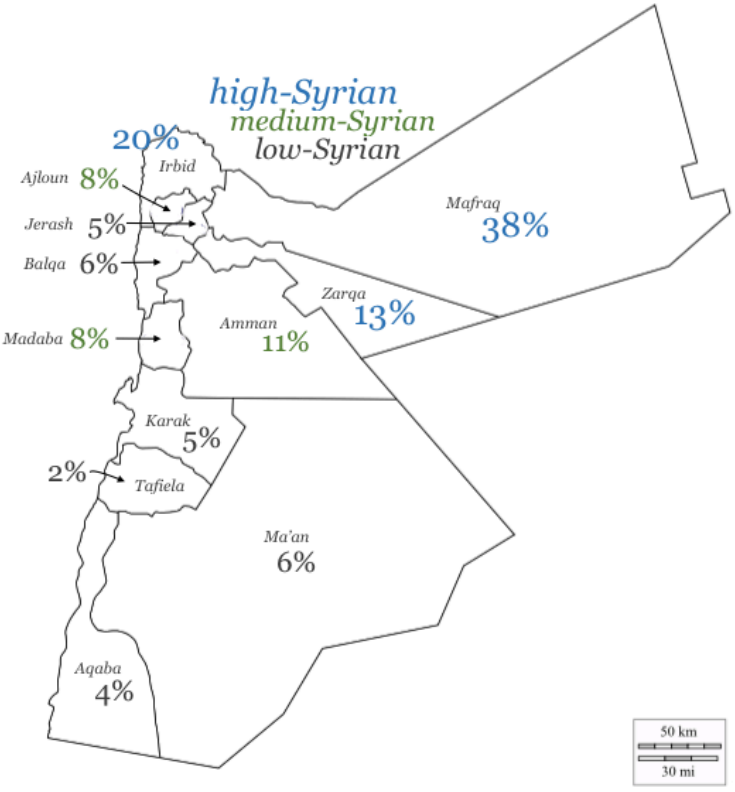
	2003 EUS (1)	2005 EUS-Adjusted (2)	2004 Census (3)	2014 EUS (4)	2014 EUS-Adjusted (5)	2015 Census (6)
Jordan Total	0.34%	0.99%	0.75%	5.5%	13.0%	13.3%
Amman	0.55%	1.60%	1.15%	5.3%	8.2%	10.9%
Balqa	0.24%	0.31%	0.41%	1.6%	6.1%	5.7%
Zarq	0.15%	0.47%	0.42%	4.0%	11.7%	12.9%
Madaba	0.29%	0.41%	0.41%	2.9%	7.4%	7.8%
Irbid	0.15%	0.63%	0.43%	8.0%	25.7%	19.5%
Mafraq	0.72%	1.65%	1.51%	12.3%	34.2%	37.8%
Jerash	0.21%	0.32%	0.28%	3.9%	3.7%	4.6%
Ajloun	0.32%	0.09%	0.19%	3.4%	9.2%	8.3%
Karak	0.09%	0.54%	0.34%	3.0%	3.3%	5.4%
Tafileh	0.02%	0.58%	0.32%	2.4%	0.7%	2.0%
Maan	0.37%	0.57%	0.78%	6.1%	6.1%	5.9%
Aqaba	0.19%	0.98%	0.60%	1.4%	2.5%	4.1%

The advantage of using these weights is that the survey data will reflect more accurate compositional elements of the labor force by nationality. The disadvantage is that doing so assumes that the observations for the under-sampled groups are representative of the experiences of that group as a whole. This is a strong assumption, since the sampling frame excludes enclaves of foreign populations in the worst socio-economic conditions. Therefore, trends for foreign national groups such as Syrians and Egyptians examined in this paper are likely biased toward more favorable outcomes. It would be reasonable to expect the average reality is less favorable than the data shown in section 4.

3.2 Proportion Syrian as a Treatment Variable

In the post-influx period, the twelve administrative governorates in Jordan experienced a population surge in Syrians in varying degrees of intensity. Largely due to the positioning of Syria on the northern border of Jordan, the northern governorates experienced the largest increase in Syrians as a proportion of their pre-influx population and southern governorates the smallest. To identify whether the degree of fluctuations in labor market trends is at all associated with the degree of increase in Syrian refugees, the governorates are used as a unit of analysis and assigned to three treatment levels. The level of treatment to which a governorate is assigned is determined solely by the proportion of Syrians in the governorate population as calculated in the 2015 census.

Prior to the conflict in Syria, Syrians made up less than 1% of the entire Jordanian population. Census counts in 2004 show a consistently low presence of Syrians across the 12 governorates in Jordan, with the highest proportion in Mafraq, at 1.5%, and the smallest in Jerash at 0.28%. Post-influx, Syrians make up 13.3% of the total population in Jordan, ranging from 2% in Tafiela to 38% in Mafraq (Fig. 4; Table 2). The *high-Syrian* category includes two northern governorates, Mafraq and Irbid, and one central governorate, Zarqa (Fig. 4, Table 2).



The *medium-Syrian* category includes one northern governorate, Ajloun, and two central governorates, Madaba and Amman (Fig. 4, Table 2). The *low-Syrian* category includes all the southern governorates and one of each of the central and northern governorates (Fig. 4, Table 2). I determined the cut-off between medium-Syrian and low-Syrian categories on two priorities: one, to separate the governorates that are close to 10% Syrian by national counts and those that are closer to 5% by national counts and two, to have similarly sized categories at the aggregate treatment level (each category composes roughly one-third of thepopulation of Jordan). Figure 3 shows the growth in Syrians by governorate level and Figure 4 shows the growth by aggregate treatment level.

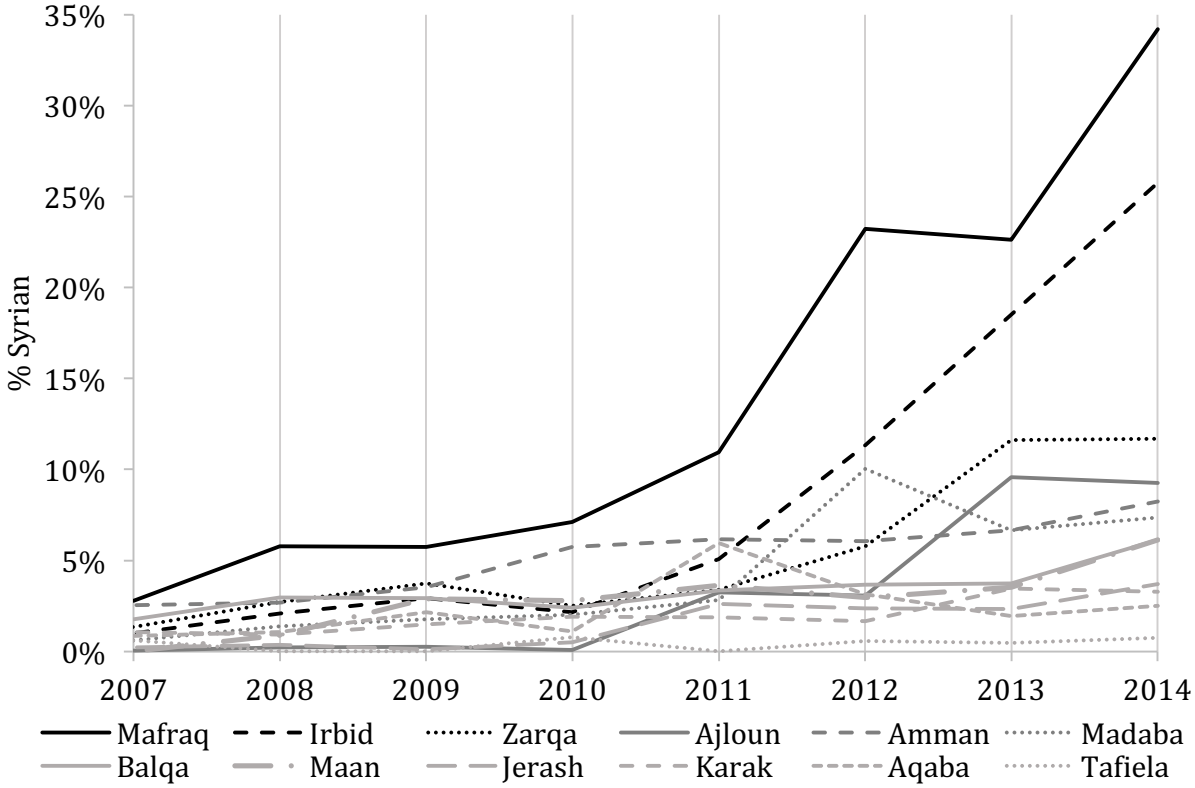
Table 2. Treatment Variable Definition

	Governorate	Region	Pr(Syrian) 2014 EUS	Pr(Syrian) 2015 Census
Low-Syrian	Tafileh	South	0.7%	2.0%
	Aqaba	South	2.5%	4.1%
	Karak	South	3.3%	5.4%
	Jerash	North	3.7%	4.6%
	Maan	South	6.1%	6.1%
	Balqa	Central	6.1%	5.7%
Medium-Syrian	Madaba	Central	7.4%	7.8%
	Amman	Central	8.2%	10.9%
	Ajloun	North	9.2%	8.3%
High-Syrian	Zarqa	Central	11.7%	12.9%
	Irbid	North	25.7%	19.5%
	Mafraq	North	34.2%	37.8%

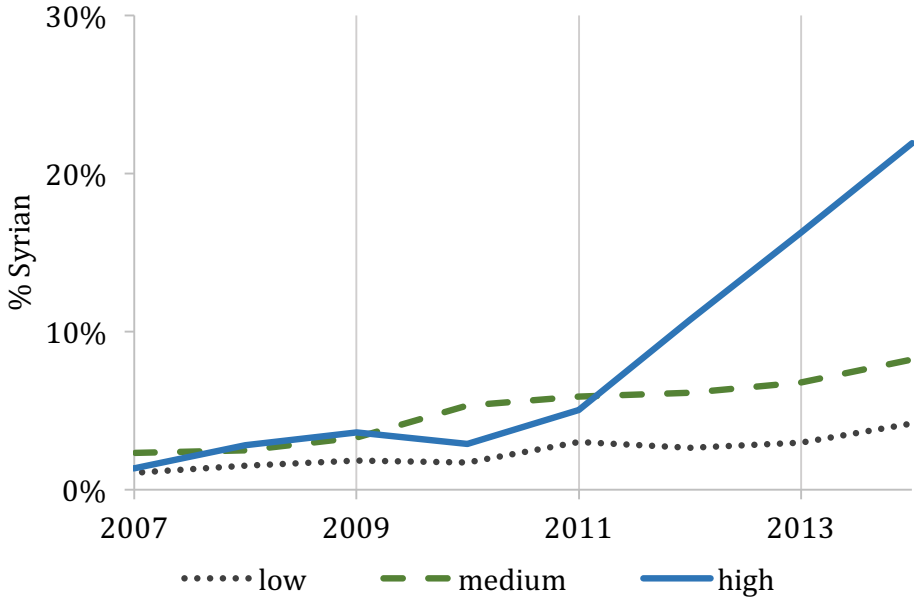
Note: EUS Proportions are the weighted estimates from using census bounds and EUS annual percentage changes. Source: OAMDI 2014, JDoS 2015

Figure 4. Growth in Syrians by Governorate and by Treatment Level

A. Proportion Syrian by Governorate
EUS Data 2007-2014, with Census-Adjusted Weights



B. Proportion Syrian by Treatment Level



Sources: Jordan DoS, Housing and Population 2015; OAMDI 2007-2014

3.3 Household Characteristics

In the EUS 2014 data, Jordanian families had an average of 5.5 people per household, Syrians had an average of 5.7 per household, and Egyptians an average of 1.6 per household (Table 3).[4] Jordanians have the highest number of labor force participants per household on average, compared to the other nationalities. In 2014, the number of labor force participants in Syrian households dropped to 0.7 (Table 3). In 2010 and 2011, only 7-8% of Syrian households had no labor force participants; by 2014, this figure had grown to 46.33% (OAMDI 2010-2011). This figure is much smaller for Jordanian and Egyptian households, where 16.5% and 2.4% respectively had no labor force participants in 2014 (OAMDI 2014). Only 10% of all Syrian households in 2014 had more than one active labor force participant, compared to 28% of Jordanian and 14% of Egyptian households (OAMDI 2014).

Table 3. Household Size and Number of Labor Force Participants in the Household, By Year and Nationality, EUS 2007-2014

		2007	2008	2009	2010	2011	2012	2013	2014
Jordanian	HH Size	6.4	6.3	6.2	6.1	5.9	5.8	5.7	5.5
	Num. Workers	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3
Syrian	HH Size	5.5	5.5	5.7	5.5	5.3	5.9	5.8	5.7
	Num. Workers	1.6	1.7	1.6	1.4	1.4	1.3	0.9	0.7
Egyptian	HH Size	4.1	4.0	3.8	3.7	3.3	3.0	2.7	2.6
	Num. Workers	2.3	2.1	1.9	1.7	1.6	1.5	1.3	1.2
Other	HH Size	5.7	5.8	5.9	5.6	5.3	4.7	4.5	3.9
	Num. Workers	1.5	1.4	1.4	1.4	1.4	1.1	1.3	0.9

[4] The low household size for Egyptians is attributable to this demographic being young, unmarried male migrants, as noted previously.

4 Analysis of Labor Market Trends

To identify the nature of the effect of a labor supply shock, economists find it helpful to examine trends at the extensive and intensive margins. The extensive margin of the labor supply is the number of workers in the labor force and the intensive margin is the number of hours worked by each worker (Blundell 2011). Declining participation rates or increasing unemployment rates represent changes at the extensive margin. Disruption of trends in working hours or wages represent changes at the intensive margin. Decomposing changes in labor supply dynamics in Jordan by trends at the extensive and intensive margins in the pre- and post-influx period make it possible to examine the question of whether unemployment or underemployment (or both or neither) have increased after the influx of refugees. Examining trends at the extensive and intensive margins also provides a useful framework for identifying the nature and extent of the structural vulnerabilities brought on by the population shock. I observe minimal changes at the extensive margin for Jordanians, but a sizeable increase in unemployment for Egyptians living in high-Syrian governorates. I also find adverse effects on the intensive margins for workers of all nationalities in the informal private-wage sector. Syrians have the worst outcomes of all three nationality groups on both the extensive and intensive margins.

4.1 Labor Supply: Effects at the Extensive Margins

As Syrians grew to 13% of the population in Jordan in 2014, they made up 9% of all labor force participants in that year (OAMDI 2014).[5] Syrians composed 4% of the

[5] The labor force is broadly defined as people between the ages of 15 and 64 who are employed and those who are unemployed (wanting and searching for work). The denominator of the rate includes non-participants who are classified as "out of the labor force," including the disabled, discouraged unemployed

population in the *low-Syrian* governorates, compared to 8% in the *medium-Syrian* and 13% in the *high-Syrian* governorates (Fig. 8A). Due to the increase in Syrian labor force participants, in addition to a steady growth in Egyptian migrant workers from 2007-2014, Jordanians' share of the labor force has dropped from 83% to 63% (Fig. 8A).

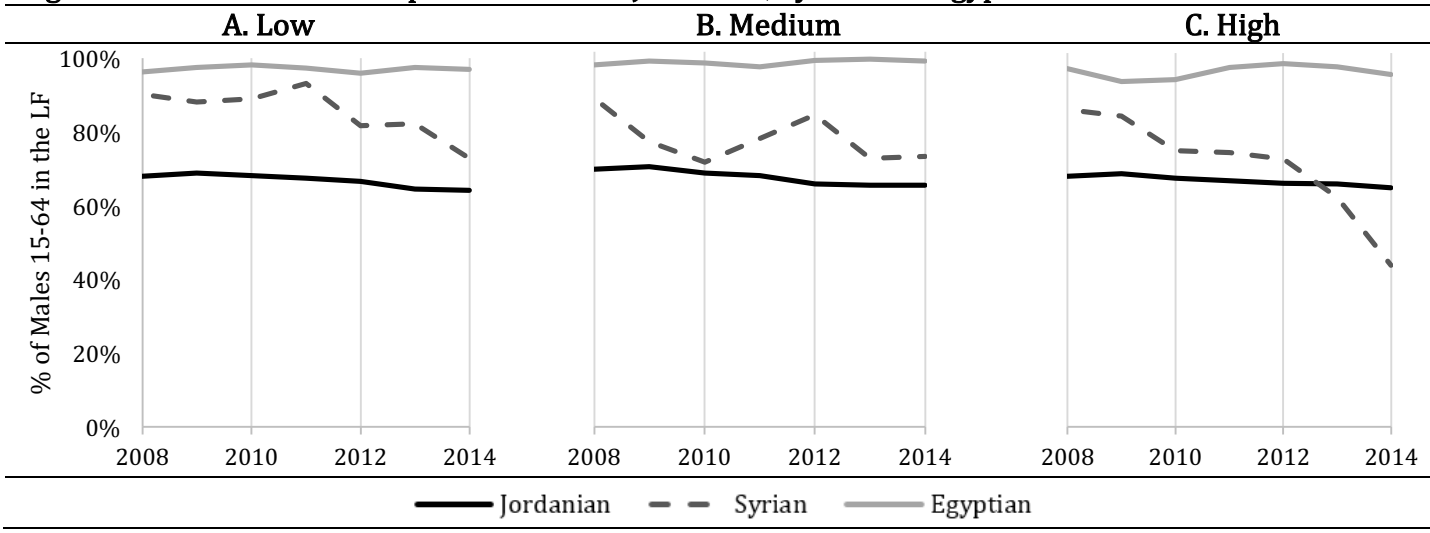
Even though the Jordanian share of the labor force is declining, changes in the Jordanian labor supply at the extensive margins in the post-influx period have been minimal. From 2008-2014, Jordanian males participated in the labor force at rates between 59% and 75% across the 12 governorates, with the highest rates in Aqaba, in the south, and the lowest rates in Ajloun, in the north (OAMDI 2008-2014). At the aggregate treatment level, participation rates for Jordanian males fell 3-4 percentage points from 2010-2014 in each of the *low-Syrian*, *medium-Syrian* and *high-Syrian* groups (Fig. 5). Notably, trends at the governorate level show that two *low-Syrian* governorates, Maan and Aqaba, experience the largest decline in participation rates in the post-influx period, falling 8.6 and 7.1 percentage points respectively from 2010 to 2014 (OAMDI 2010-2014). This could be an indirect effect of the influx of Syrians insofar as the growth of Syrians in the North instigated a migration of Egyptians to the South where they have less competition for jobs.

The data reveals little evidence that the influx of refugees has led to unemployment among Jordanians. At the aggregate treatment-level, Jordanian unemployment rates fell 1 percentage point from 2010-2014 (Fig. 6). Unemployment rates for Jordanians increased from 2010-2014 in only four governorates: Irbid, Ajloun, Balqa and Tafileh, at 1.4, 3.3, 4.5

(those who need work but have stopped looking), students, and those who for other reasons are not able or not needing to work.

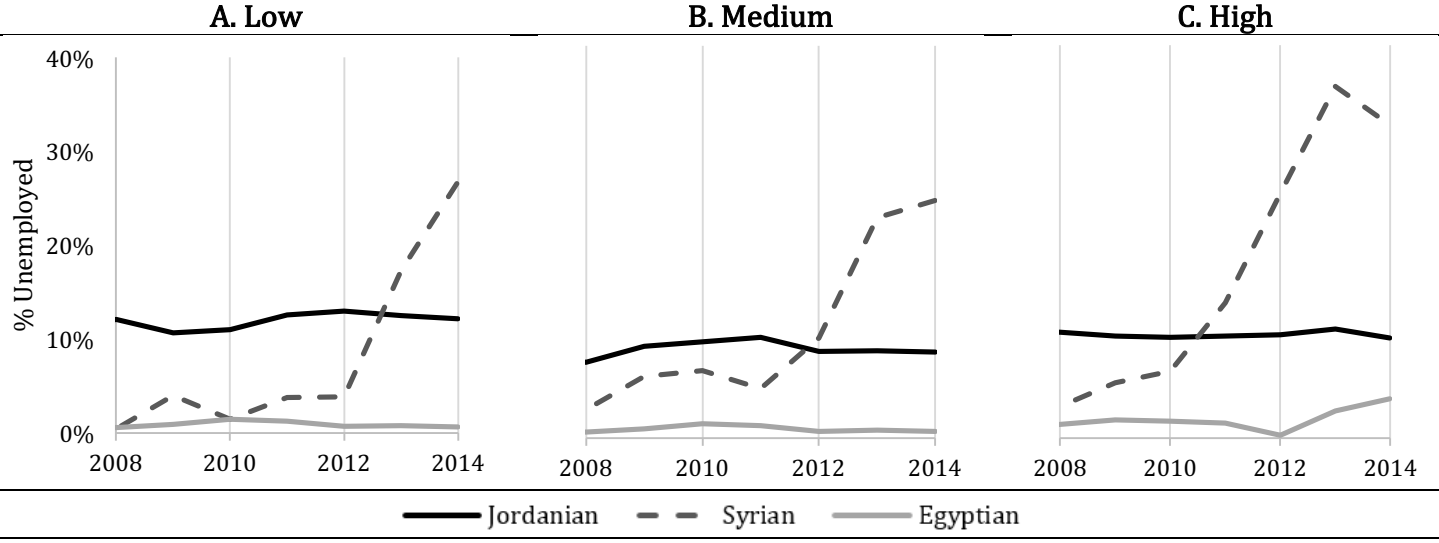
and 3.4 percentage points respectively (OAMDI 2010-2014). The other governorates experienced decreases in unemployment in the post-influx period.

Figure 5. Labor Force Participation Rates for Jordanian, Syrian and Egyptian Males 2008-2014



Egyptian males across all three treatment levels have near 100% participation rates between 2008 and 2014 and unemployment rates below 2% across the same period (Figs. 5, 6). The one exception to the stable unemployment rates is in the *high-Syrian* category, where the unemployment rate for Egyptians grew 4 percentage points in the post-influx period (Fig. 6C). This increase is meaningful and is likely a direct consequence of the influx of refugees. As discussed in section 2.2.2, Egyptians are economic migrants whose contribution to the labor market is comparable to the new Syrian population. The substitutability of Syrian for Egyptian labor at least partially explains the increase in unemployment among Egyptians in the *high-Syrian* group in the post-influx period.

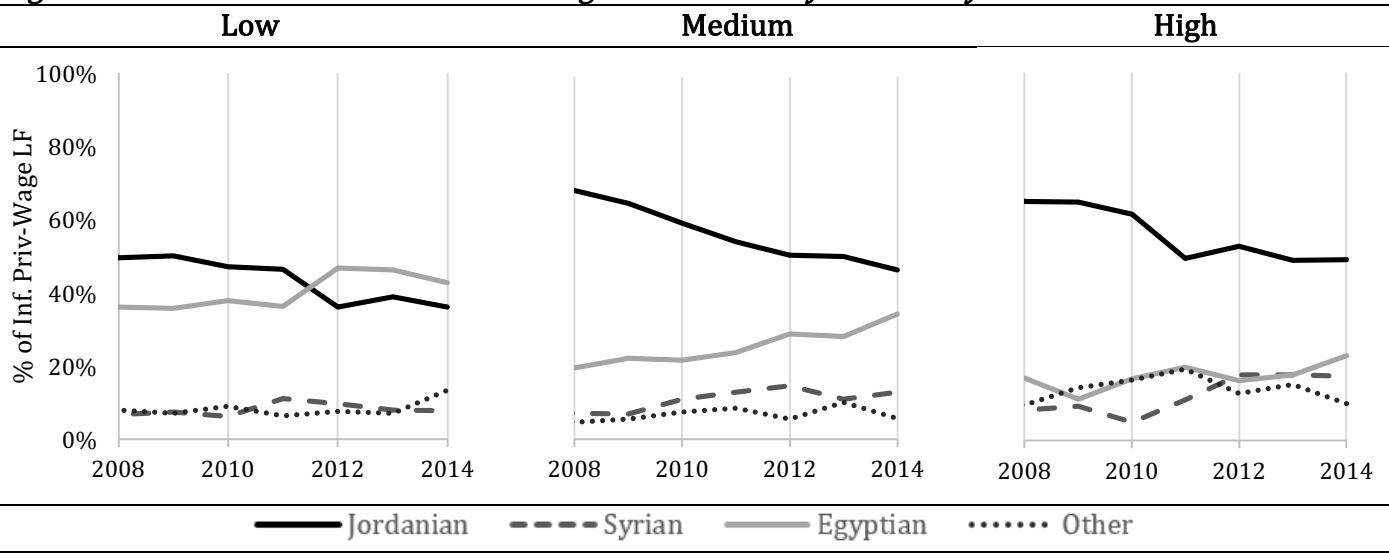
Figure 6. Unemployment Rates for Jordanian, Syrian and Egyptian Males 2008-2014



A look at the changing composition of the labor force by nationality in the three treatment categories connects the rising unemployment for Egyptians in the *high-Syrian* category with falling participation rates for Jordanians in the *low-Syrian* category. These trends exist for the entire labor force (Fig. 8A), but are even more pronounced in the informal private-wage labor force. In the *high-Syrian* category, the upward trend of Egyptians' share of the informal private-wage workforce reverses for a two-year period after 2011 (Fig. 7C). In the same period, the Egyptian share of the informal private-wage workforce spikes 10 percentage points in the *low-Syrian* governorates, which is notable given that the pre-influx trend line was flat. Since Egyptians live in Jordan for the express purpose of working, it follows that they would sooner migrate than remain unemployed. One possible interpretation is that the influx in the *high-Syrian* governorates simultaneously induced some unemployment among Egyptians and some migration of Egyptians to the *low-Syrian* governorates where they would have less competition for work. The increased competition from Egyptians in the *low-Syrian* governorates in the

post-influx period may be connected to the declining participation rates for Jordanians in those areas.

Figure 7. Share of the Informal Private-Wage Labor Force by Nationality



Comparing effects at the extensive margins across Jordanians, Egyptians and Syrians shows evidence that Syrian males themselves have the worst outcomes of all on the participation and unemployment rate indicators (Figs. 5, 6). Unemployment rates for Syrians spike upward in the post-influx period, increasing 23 percentage points in the *low-Syrian* category, 19 percentage points in the *medium-Syrian* category and 25 percentage points in the *high-Syrian* category (Fig. 6). Part of the explanation for the rapid spike is that the Syrians living in Jordan in the pre-influx period had low unemployment rates. Even so, the rates at which Syrians experience unemployment in the post-influx period is glaring and provides evidence of the extent of the limited access Syrians have to the labor market. The rise in unemployment likely corresponds with the declining labor force participation rates among Syrian males as they become discouraged unemployed and drop out of the

labor force altogether (Fig. 5). Participation rates for Syrians fell 31 percentage points in the *high-Syrian* governorates in the post-influx period (Fig. 5C).

4.2 Informal Labor Supply: Effects at the Intensive Margins

Public sector and formal private sector jobs in Jordan have been largely insulated from the labor supply shock, since Syrians have virtually no access to jobs in those arenas.[6] The fact that Syrians constitute substitutes for labor in such a specific sub-sector of the labor market in Jordan helps make sense of the relatively small changes seen in the Egyptian and Jordanian workforce at the extensive margins. However, it also begs for further examination of the implications for the sub-sector of the labor market where Syrians are competing for jobs: the informal private-wage sector. Since the EUS data is repeated cross-section and not panel data, it is not possible to examine participation and unemployment trends among males employed in the informal private-wage sector. Therefore, I make use of indicators at the intensive margins to detect effects of the influx on workers in the informal private-wage sector.

4.2.1 Informal Private-Wage Work

Among male wage-workers, about 50% of Jordanians and between 90%-100% of Egyptians and Syrians work in the private sector across the period 2008-2014 (Fig. 9B). For Jordanians, this rate varies between 40%-70% across the three categories of treatment (Fig. 9B). Decomposing private-wage workers into those working formally and informally is difficult because EUS does not gather data on informality of employment. As a work-

[6] A possible indirect effect might be cross-sector mobility of Jordanians moving into public or formal-private jobs as competition grows in the informal-private sector; but Fig. 8 shows that the sector decomposition of the Jordanian workforce has remained relatively constant from 2007-2014. Still, further analysis of this possibility would be worthwhile.

around, I created an index of informality of occupations from a different survey, the Jordan Labor Market Panel Survey – 2010 (JLMPS), to categorize occupational activity as formal or informal. The JLMPS was developed by the Economic Research Forum in Cairo, led by Dr. Ragui Assaad of the Humphrey School of Public Affairs. The JLMPS questionnaire asks some of the same questions as the EUS, including occupation, but also asks questions to determine formality of employment. These questions include whether the worker has a pension plan, sick leave or health benefits, as well as questions about the size and location of the workplace. Using the formality indicator from the JLMPS cross-classified with the standardized occupation codes, which are the same in the EUS, it is possible to identify the occupations that are most likely to be informal in nature.

The cross-classification shows a list of occupations in which more than 60% of those employed identified their work as informal. Together, these 11 occupations capture 40-45% of the entire workforce from 2007-2014. For the analysis, I constructed an indicator variable, *informal*, that is equal to 1 if the individual works in an occupation that is more than 60% informal. The 60% threshold is not scientific, but serves as a compromise between two priorities: one, that the informal indicator would capture almost all of the Syrian workforce and two, that only occupations with a strong majority working informally would be included in the indicator. For the remainder of the analysis, I refer to these workers as 'informal private-wage workers', with informality imperfectly defined by employment in a largely informal occupation.

Among Jordanians working in private-wage jobs from 2008-2014, between 50%-70% are employed informally, with the highest rates of informality in the *high-Syrian* category (Fig. 9C). Except in the *medium-Syrian* governorates, Egyptians in private-wage

work are employed informally at higher rates than Jordanians, between 65%-80% from 2008-2014 (Fig. 9C). Private-wage working Syrians are employed informally at the highest rates of all, between 70%-90% in the post-influx period (Fig. 9C). The apparent predominance of informal private-wage work as an avenue for Syrian employment confirms that this is the sub-sector where Jordanians and Egyptians have faced the most direct competition in the post-influx period.

Between 25%-28% of all employed Jordanian males across the nation from 2007-2014 are working in 'largely informal' private-wage jobs (OADMI, EUS 2007-2014). This figure varies from a low of 10% in Tafileh to a high of 30%-40% in Zarqa from 2007-2014 (OADMI, EUS 2007-2014). By contrast, an average of 50%-60% of employed Egyptian males and 60%-70% of employed Syrian males are working in the 'largely informal' private-wage sector (OADMI, EUS 2007-2014).

Table 4. Largely Informal Occupations in Jordan
Data from Jordan Labor Market Panel Survey (2010)

Occupation Label	ISCO-08 2-digit Code	% Informal	N
Subsistence farmers, fishers, hunters and gatherers	63	98.5	156
Street and related sales and service workers*	95	93.2	536
Sale workers	52	91.5	119
Market-oriented skilled agricultural workers	61	91.4	48
Agricultural, forestry and fishery labour workers	92	81.1	286
Building and related trade workers	71	80.9	238
Food processing, wood working, garment	75	79.8	195
Food preparation assistants	94	68.6	560
Drivers and mobile plant operators	83	67.0	59
Metal, machinery and related trades workers*	72	66.3	15
Personal service workers*	51	62.3	28

**Note that occupations with an asterisks are N<30*

4.2.2 Weekly Working Hours

To examine effects at the intensive margins for males working in informal private-wage jobs, I looked at trends in average weekly working hours and in the proportion working below full employment by treatment level and nationality (Figs. 10, 11). I defined full employment as a 40-hour work week, since minimum wage laws in Jordan are based on 40 hour work weeks, and created three variables to capture three categories of underemployment: those working below 40 hours a week, those working below 30 hours a week, and those working below 20 hours a week.

Weekly working hours for Jordanians in informal private-wage work across the 12 governorates trend downward from an average of 50 hours in 2007 to an average of 45 hours in 2014, with evidence of a more pronounced dip in the *high-Syrian* governorates in the post-influx period (Fig. 10A). At the aggregate treatment level, the decrease in average weekly working hours from 2010-2014 amounts to 2.3 hours at the *low-Syrian* level, 1 hour at the *medium-Syrian* level, and 2.6 hours at the *high-Syrian* level. In the *low-Syrian* governorates, the dip is short-lived and either stabilizes or reverses by 2012 for all governorates in this category except Karak and Tafiela (Fig. 10A). In the *medium-Syrian* governorates, the decline in weekly working hours is most pronounced in Ajloun, and levels only gradually move back toward their pre-influx levels. It is not surprising that the effects of the influx would spill-over into Ajloun located just south of Irbid, a *high-Syrian* governorate, and Syrians would be able to commute to Ajloun for work with ease. Jordanians in Madaba also experience a gradual decline in working hours in the post-influx period, but it reverses decidedly in 2013 (Fig. 10A). In the *high-Syrian* governorates,

average working hours in Mafraq and Irbid decline by about 10 hours from 2010 to 2012, and remain at about 38 hours per week through 2014 (Fig. 10A).

While the average weekly working hour trends barely dip below 40 hours a week, the proportion of Jordanians working below 40 hours a week increases from 15% in 2010 to 25% in 2014 in the *low-Syrian* governorates and from 20% in 2010 to 28% in 2013 in the *high-Syrian* governorates (Fig. 11A). The trend for proportion working below 40 hours at the *medium-Syrian* level declines 3 percentage points between 2010-2014. The other two categories of underemployment do not appear to have changing trends associated with the 2011 cut-off. The data does show some evidence of increases in proportion working below 30 hours a week and below 20 hours a week from 2010-2011 for *low-Syrian* and *high-Syrian* governorates, though the trend reverses after 2011 (Fig. 11A). Most of the underemployment in the Jordanian informal private-wage workforce is in the form of increased proportions of people working below 40 hours a week.

For Egyptians at the *low-Syrian* level, average weekly working hours shift down by about 10 hours from 55 hours in 2007 to 45 hours in 2014 at the aggregate level, but all individual governorates in this category except for Balqa and Tafileh see at least a modest incline in weekly working hours in the immediate post-influx period (Fig. 10B). In the medium group, a decline in working hours is apparent around the 2011 cut-off, most notably for Ajloun. Workers in Ajloun experienced a 15 hour decline from 2011 to 2013, though the trend reverses from 2013 to 2014 (Fig. 10B). Working hours for Egyptians in the *high-Syrian* category are also trending downward. The decline in average weekly working hours begins in 2011 and does not reverse by 2014 (Fig. 10B). It amounts to a 6 hour decline per week for workers in Mafraq and a 4 hour decline for workers in Irbid.

Graphs for Egyptians in the three categories of underemployment show a lot of volatility in weekly working hours (Fig. 11B). This is likely due both to the genuine volatility of work in the informal private-wage sector and measurement error in the data collection process. Even so, the proportion of Egyptians working below-40 hours a week increases 7 percentage points in both the *high-Syrian* and *medium-Syrian* categories in the immediate post-influx period, respectively from 24% to 31% and from 13% to 20% between 2010 and 2013 (Fig. 11B). Notably, the trend reverses from 2013 to 2014, suggesting that Egyptians are self-adjusting to the increased competition from Syrians – most likely by moving South or moving home. The percentage of Egyptians working below-30 and below-20 hours decreases in the post-influx period in the *high-Syrian* governorates.

Trends for Syrian average weekly working hours are aggregated at the treatment level because of small sample sizes at the governorate level. There are no extreme changes in the weekly working hours trends for Syrians, but a decline of 3-5 hours from 2010 to 2014 exists across all three treatment levels on average. Proportions of Syrians in the three categories of underemployment increase notably in the post-influx period and are larger in magnitude than proportions of Jordanians and Egyptians in the similar categories (Fig. 11C). By 2014, nearly 35% of Syrians living in the *high-Syrian* category and employed in informal private-wage work are working below 40 hours a week (Fig. A11c).

4.2.3 Monthly Income

In 2012, the monthly minimum wage in Jordan was set at 190 Jordanian Dinars (JD) for locals and 110 JD for migrants. (U.S. Social Security Administration 2014). In U.S. currency, that is $133 and $77 per month, respectively. This monthly minimum is set with an expectation that wage-workers will work eight hours per day and 5 days per week, thus

amounting to a 4.75 JD hourly wage minimum for Jordanians and 2.75 JD hourly wage minimum for migrants (Oddone 2014). A 2013 UNDP report defined the absolute poverty line in Jordan as 67.8 JD per individual per month, or 366.3 JD per household per month (UNDP 2013a). The report also defines an abject poverty line as 28 JD per individual per month or 151.2 JD per household per month (UNDP 2013a). These thresholds are useful for identifying populations for whom underemployment has led to economic vulnerability.

The data collected in the EUS for income is categorical, which creates inherent limitations for analyzing wage trends. The question asks for the worker's total monthly income in Jordanian Dinars (JD) in the last month and then reports the answer in one of five categories: less than 100, 100-199, 200-299, 300-499 and 500 or more. Therefore, calculating average or median monthly wages has little meaning as far as levels are concerned. Nevertheless, it is still possible to use this variable to discern trends. Using the UNDP values for absolute and abject poverty lines using monthly income in JD, I set out to identify the trends in proportion of informal private-wage working males making below poverty wages (2013a). Four important steps render this a useful measure: first, I transformed the categories to take on real values in 2013 Jordanian dinars. Second, I calculated a total "real" monthly income variable as the sum of the monthly wages for all the employed persons in the household.[7] Third, I divided the total monthly household wages by the size of the household. And finally, I defined informal private-wage working males who earned less than 67.8JD per person per month as "below absolute poverty" and those who earned less than 28JD per person per month as "below abject poverty" (Fig. A12).

[7] Includes income from self-employed persons and employers in the household

For Jordanian informal private-wage workers, the increase in proportion making below abject poverty wages for their household is small, but present – especially in the *high-Syrian* category (Fig. 12A). In the *high-Syrian* group, the percentage of informal private-wage working Jordanians earning below absolute poverty monthly income grew from 46% in 2010 to 55% in 2013 (Fig. 12A). The percentage earning below abject poverty income grew from 6% in 2010 to 9% in 2013, but returned to 7% in 2014 (Fig. 12A). In the same period, growth in proportion below the absolute poverty margin amounted to 5 percentage points for workers in the *medium-Syrian* category and 3 percentage points for those in the *low-Syrian* category (Fig. 12A). Jordanians in Ajloun experienced the largest leap in the proportion working for below absolute poverty wages, growing 13 percentage points from 2010 to 2013 (OAMDI 2010-2013).

Egyptian workers experienced very little change in proportion working for below poverty wages on either the absolute or abject margin. In neither case do trends appear to be related to the influx of refugees. The nature of Egyptian laborers as single males can lead to a deceiving appearance of prosperity in the per capita wage measure. Rather than living with dependents and spreading their monthly wages across 5 people, as in Jordanian households, Egyptian workers live with other single Male Egyptian workers, resulting in much larger per capita wages (Table A3). Since EUS does not capture the amount of monthly income that Egyptians remit, it is not possible to transform the per capita measure to reflect the reality of how much Egyptian workers live on. Therefore the levels of proportion of Egyptians living below poverty lines are likely underestimates and the trend lines are inconclusive. As previously mentioned, the lack of change on the wage outcome could also be that Egyptians are migrating as underemployment looms.

The growth in proportion of Syrian informal private-wage workers making below absolute and below abject poverty wages per capita is glaring, averaging 32 and 7 percentage points respectively across the 12 governorates (OAMDI 2014). The proportion making below absolute poverty wages grows from 34% in 2010 to 68% in 2013 in the *high-Syrian* governorates, 17% to 54% in the *medium-Syrian* governorates and 13% to 58% in the *low-Syrian* governorates over the same period (Fig. 12C). The growth in proportion making below abject poverty wages is more modest in the *medium* and *low-Syrian* governorates (3 and 6 percentage points, respectively), but is still large in the *high-Syrian* governorates (Fig. 12C). The increase amounts to 18 percentage points from 2010 to 2014 in Mafraq and 32 percentage points over the same period in Irbid (OAMDI 2010-2014).

5 Implications and Recommendations for Further Study: Addressing Short-Term Vulnerabilities and Facilitating Long-Term Growth

5.1 Implications of Underemployment

The adverse effects of the sudden increase in the labor supply in Jordan seem to be shouldered primarily by Syrians, who are struggling to find work. The work they do find is in a largely informal and unprotected work environment where monthly wages are far too low to sustain family life. The EUS data suggests that Jordanians, on average, have been insulated from the shock, though underemployment is a growing problem for Jordanian households with breadwinners in informal private-wage jobs. I estimate that about 15%, 12.7%, and 8% of all employed Jordanians in the *high-Syrian, medium-Syrian* and *low-*

Syrian governorates, respectively, are earning below-poverty monthly wages.[8] Egyptians appear to be self-adjusting to the increasing competition for jobs, either by moving South or by moving home. Sustaining vulnerable populations in the short-term will require efforts to identify unregistered populations of refugees and Jordanian households that have been pushed below the poverty line in the post-influx period. In the long-term, addressing vulnerability due to underemployment requires expanding formal income-generating opportunities.

The UNHCR has recently developed a vulnerability assessment framework to target aid to Syrian families, using combined measures of monthly expenditures and income (UNHCR 2017). Two points of concern arise with this aid response to the post-influx situation in Jordan. First, since unregistered Syrian refugees do not qualify for aid from UNHCR and cannot obtain work permits from the Ministry of Labor, households with unregistered breadwinners are likely enduring underemployment without the supplemental income necessary to boost them above the poverty line. Second, the EUS data shows an increase in Jordanian families who have fallen under the poverty line as a result underemployment. These two groups should be identified and targeted as potential aid recipients. This will require a political solution for granting documentation to unregistered refugees.

Even if the UNHCR could provide aid to every household in need, the issue of structural vulnerability would remain. The international community has recognized that traditional emergency relief models are limited in their ability to transition affected

[8] This is the product of the proportion of employed males working in 'informal private-wage' jobs at each treatment level multiplied by the proportion of Jordanian informal private-wage workers earning below absolute poverty monthly income at each treatment level.

populations from short-term to long-term solutions (Betts and Collier 2017, UNDP & UNHCR 2016). Facilitating long-term integration for Syrians in Jordan requires innovative development strategies that make use of refugees as a new base of consumers and supply of productive workers. One solution is for Jordan to impose regulations on the informal market. Though the Jordanian Ministry of Labor committed to a national framework for formalizing the informal labor market in 2015, follow-through in implementation has yet to be seen (Union of the Mediterranean 2015). In the meantime, multilateral efforts to expand formal private-wage job opportunities are a promising alternative approach to addressing structural vulnerabilities driven by underemployment in unstable informal private-wage jobs.

5.2 Innovating Formal Labor Market Growth

Two important innovations for pursuing formal labor market expansion in Jordan are Special Economic Zones and agricultural cooperatives. In 2016, two Oxford Professors – Paul Collier and Alexander Betts – devised an experimental model for an economic solution to the absorption dilemma in communities hosting Syrian refugees. The model sets forth a plan for the creation of five Special Economic Zones in Jordan that will house major manufacturing plants offering employment opportunities to Syrians (Betts and Collier 2017, Kelberer 2017). The funding for the Special Economic Zones comes from a trade deal between the EU and Jordan, in which the EU agreed to import 52 product groups from Jordanian manufacturing plants who employ a minimum quota of Syrian refugees (Kelberer 2017). After Betts and Collier presented the model at the London donor conference in February 2016, Jordan formally committed to the "Jordan Compact" and pledged to create 200,000 jobs for Syrian refugees (Kelberer 2017).

The ILO and Jordan's Ministry of Labor are leading another innovative labor market growth strategy that came out of the Jordan Compact: agricultural cooperatives (Kelberer 2017). The cooperative model registers Syrians for agricultural work in bulk, circumventing the necessity of a single employer sponsor for each employee. This model removes a major barrier to employment for refugees and creates more flexibility in employment, allowing Syrians to move from employer to employer (Kelberer 2017).

In February 2017, the International Rescue Committee (IRC) and the Boston Consortium for Arab Region Studies (BCARS) issued reports evaluating the Jordan Compact in its first year of implementation and offered a series of recommendations. The BCARS report applauds the initiative's success in granting 35,000 work permits to Syrian refugees in its first year – an eleven-fold increase from the number granted in the previous year (Kelberer 2017). Challenges in the first year of the initiative included a lack of administrative capacity at the Ministry of Labor and insufficient dissemination of information about the new opportunities to qualifying populations (Kelberer 2017). The IRC report also critiqued the "slow and uneven" progress toward improving labor market outcomes for refugees and vulnerable Jordanian communities (IRC 2017).

IRC suggests that despite challenges faced in the first year, the Compact, if "properly and faithfully implemented… has the potential to bring real improvement for refugees in Jordan" (IRC 2017). The advantage of the model is that it will attract investment and create new job opportunities where Syrians can engage in *full employment* in the *formal* private sector. Simultaneously, the diversion of Syrian labor to the Special Economic Zones may relieve the competition in informal private-sector jobs, ideally causing a reversal of the underemployment trends identified in section 4. The initiatives of the Jordan Compact

provide an innovative approach to addressing the structural vulnerabilities facing registered Syrian refugees and informal private-wage working Jordanians and Egyptians. A remaining gap in the Jordan Compact initiative is, as it was also in the short-term aid plan, addressing the vulnerabilities facing unregistered Syrian refugees, who will still be unable to acquire work permits without official residency status.

5.3 Recommendations for Further Study

As the world's eyes are on the crisis in Syria and continued efforts aim to support vulnerable Syrian refugee populations, I have four recommendations for further study on local labor market integration of Syrian refugees in Jordan. Two relate to further analysis using EUS data, a third relates to analysis using JLMPS data and a fourth concerns an analysis of the crisis response initiatives.

First, a follow-up to this analysis should incorporate 2015 and 2016 EUS data, published recently. After the 2015 census, DoS revised the sampling frame for EUS, meaning the 2016 data samples a representative proportion of Syrians (or at least does so with much greater precision than the bootstrapped weights used in this study). Second, further analysis incorporating 2016 data may reveal whether the trends in underemployment on the intensive margins are proving durable or if they were short-term in nature. Similarly, a study using the 2016 data should examine the extent of the formalization of Syrian labor, especially in manufacturing and agricultural occupations, resulting from the Jordan Compact initiative.

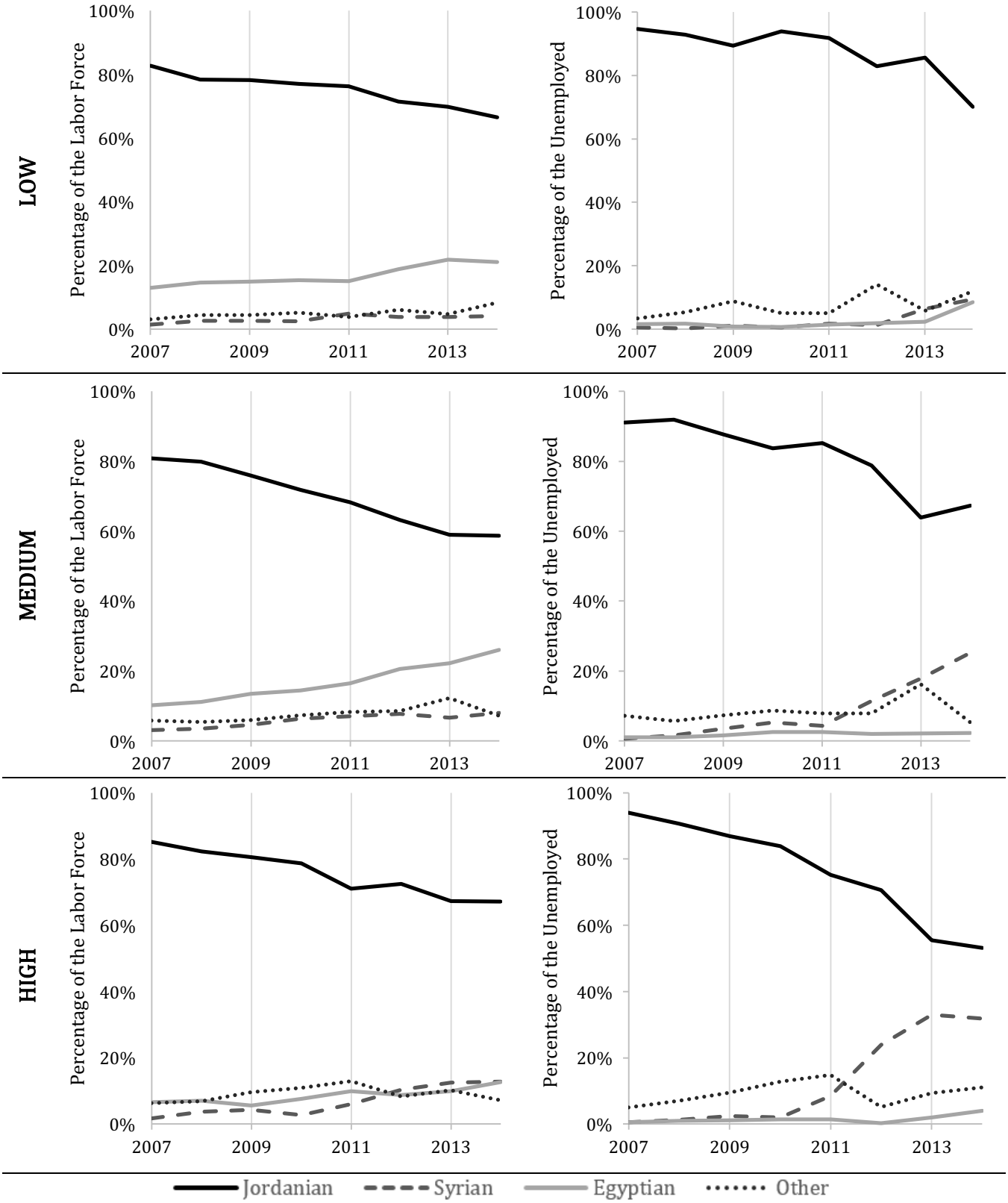
Third, a similar analysis to this study should be conducted using the JLMPS 2010 and 2016. The advantage of a similar analysis using JLMPS 2016 data, and its previous iteration from 2010, is that informal private-wage workers can be exactly identified rather

than estimated. Also, since it is a panel survey, the JLMPS 2010-2016 can answer questions of potential within-country migration of Egyptian workers in the post-influx period. Finally, the strength of the JLMPS data will allow for a stronger identification strategy to quantify labor market impacts in populations of interest using econometric techniques. Such a study will be a unique and useful contribution to the current literature in the field, where data capacity is limited and most studies are qualitative in nature.

The emphasis on measuring and addressing vulnerability in the international development research and practice community is a necessary means to diagnosing the socio-economic conditions of populations affected by conflict. However, the effort to diagnose vulnerability should be matched with an effort to identify the economic potential of vulnerable populations in their local surroundings. This leads to my fourth and final recommendation for further study. The use of Special Economic Zones and sector-specific cooperatives as an avenue for integrating Syrians into the Jordanian labor market is a promising approach to help the Jordanian government maximize the economic potential of the new population of Syrians residing inside its borders. To support the success of the Jordan Compact, its activities should be rigorously monitored, analyzed and revised throughout the course of its implementation.

Figures

Figure 8. Share of the Population in the Labor Force and in Unemployment by Nationality Males Ages 15-64, EUS 2007-2014



Note: lines add to 100%

Figure 9. Proportion Working as Wage-Workers, Private-Wage Workers, and Informal Private-Wage Workers

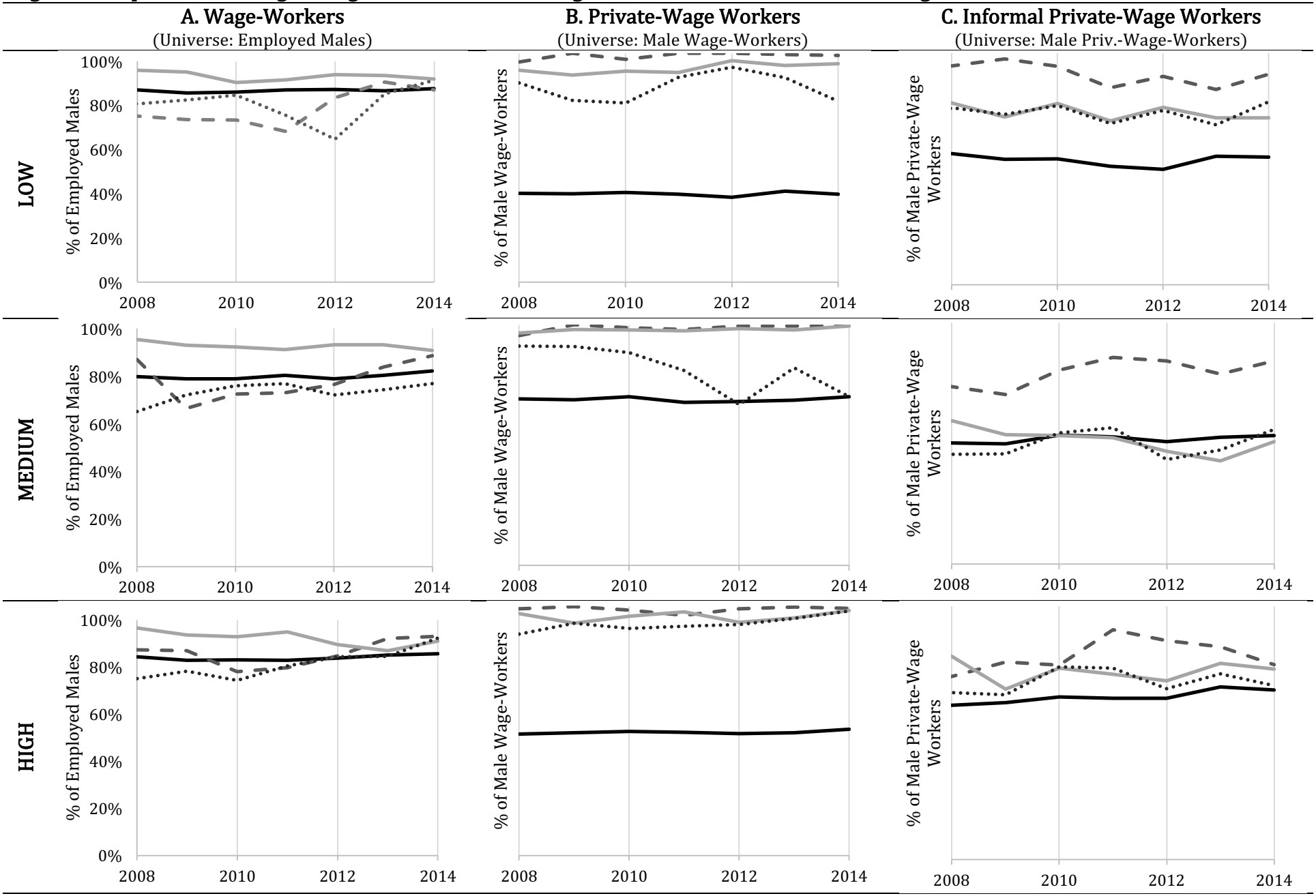
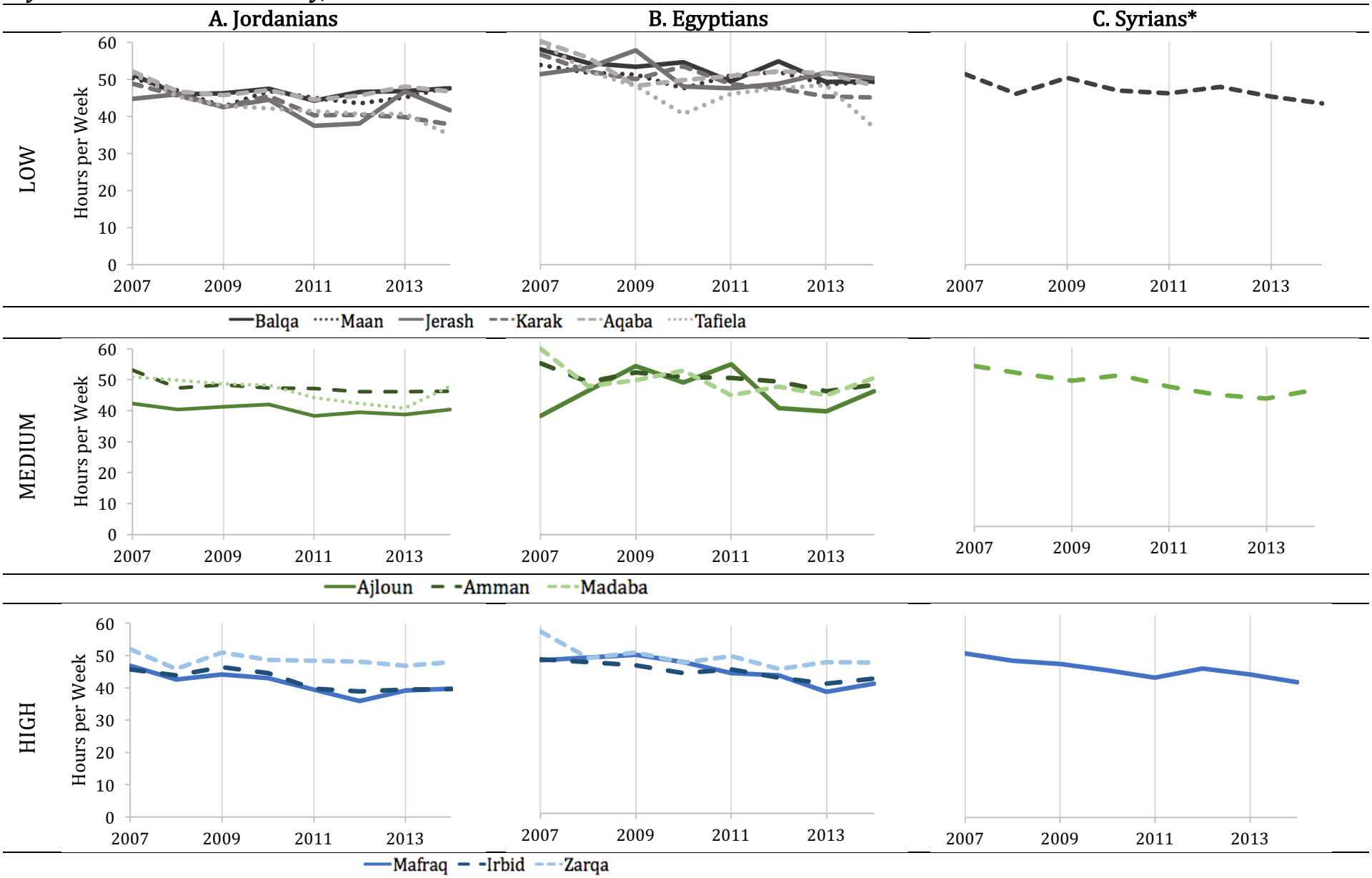


Figure 10. Participation at the Intensive Margin: Average Hours Worked by Informal Private-Wage Workers, By Governorate and Nationality, 2007-2014



**Note: Lines for Syrians show aggregate trends of all governorates in the low, medium, and high-proportion categories because of insufficient sample size in some governorates*

Figure 11. Percentage Underemployed for Different Thresholds of Weekly Working Hours, <40 hours, <30 hours and <20 hours: Male Informal Private-Wage Workers, by Treatment Level 2007-2014

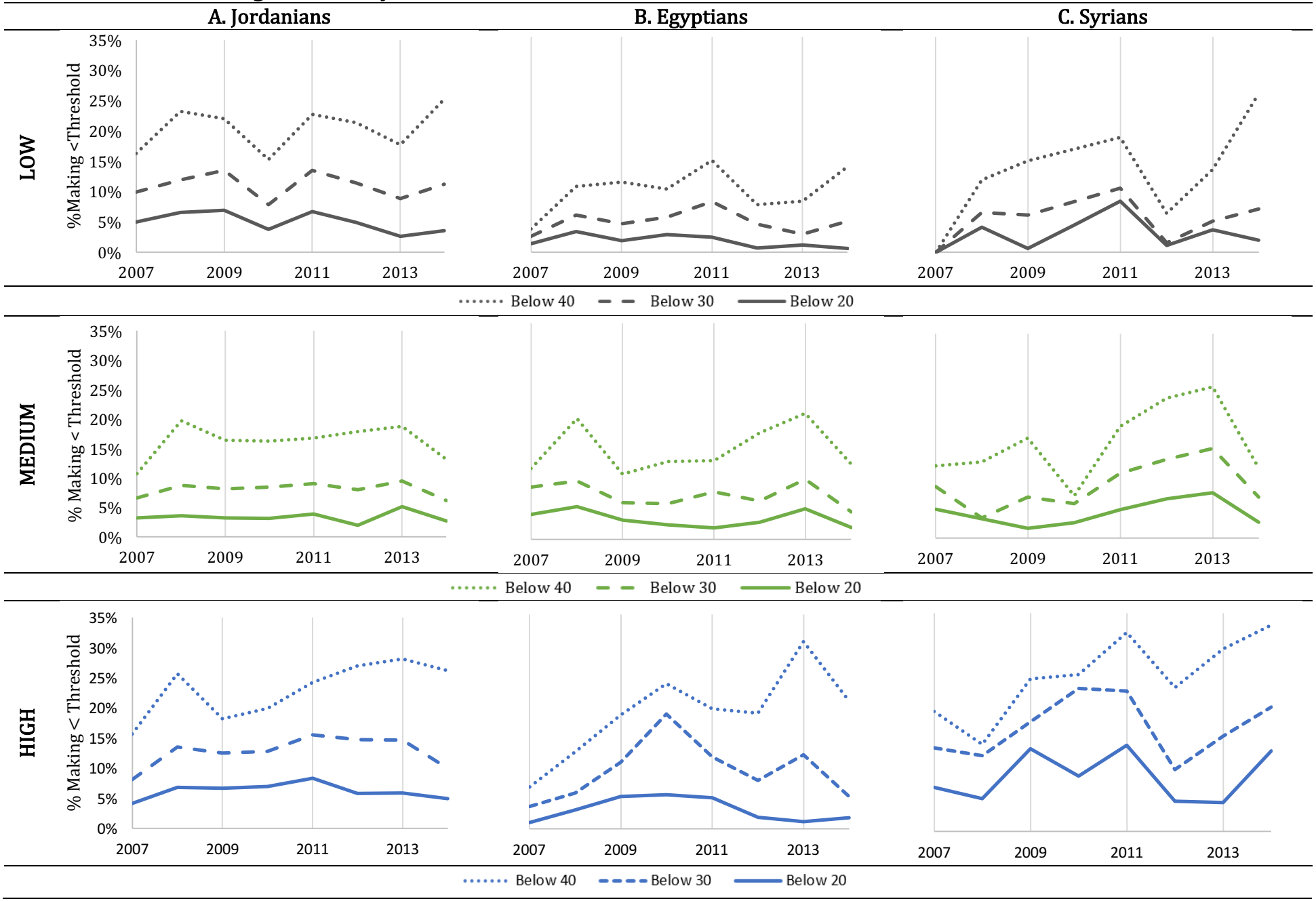
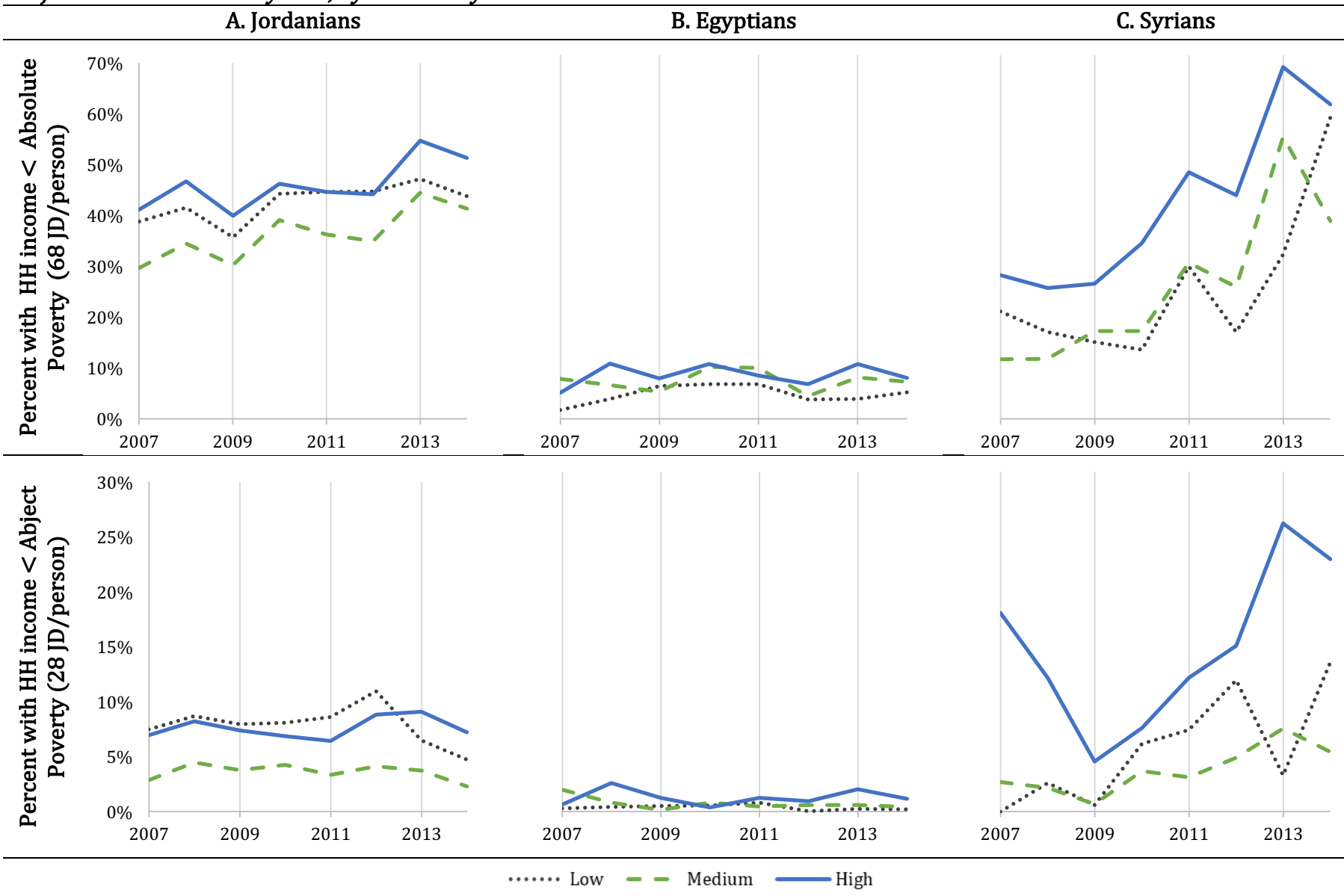


Figure 12. Proportion of Households with Male Informal Private-Wage Workers Earning Monthly Income Below the Absolute and Abject Household Poverty Line, by Nationality and Treatment Level 2007-2014



Note: Individual abject and absolute poverty lines as determined by UNDP (2013). Proportions below thresholds determind by summing household income (of all workers) and dividing by household size.

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Appendix A. Sample Sizes

Table A1. Jordan Employment and Unemployment Survey Sample Sizes, Years 2007-2014 Working Age Males by Nationality and Treatment Level

	2007	2008	2009	2010	2011	2012	2013	2014
All Jordan								
Jordanians	74,311	73,157	71,513	70,256	69,240	68,222	63,511	61,228
Syrians	344	346	354	365	356	647	1,578	2,151
Egyptians	2,689	2,966	2,735	2,642	2,282	2,275	2,044	2,019
Other	1,805	1,782	1,855	1,688	1,040	986	884	1,052
Total	79,149	78,251	76,457	74,951	72,920	72,130	68,017	66,450
Low-Syrian								
Jordanians	22,122	21,013	20,147	20,019	19,743	19,472	18,382	17,646
Syrians	70	69	68	69	72	106	256	350
Egyptians	900	1,070	965	931	698	736	669	615
Other	420	593	654	583	350	313	218	512
Total	23,512	22,745	21,834	21,602	20,863	20,627	19,525	19,123
Medium-Syrian								
Jordanians	24,594	24,209	23,664	22,994	22,783	22,572	20,691	20,134
Syrians	192	154	174	216	173	285	584	695
Egyptians	1,148	1,211	1,249	1,177	1,053	1,119	1,031	1,003
Other	780	673	633	587	388	488	511	433
Total	26,714	26,247	25,720	24,974	24,397	24,464	22,817	22,265
High-Syrian								
Jordanians	27,595	27,935	27,702	27,243	26,714	26,178	24,438	23,448
Syrians	82	123	112	80	111	256	738	1,106
Egyptians	641	685	521	534	531	420	344	401
Other	605	516	568	518	304	185	155	107
Total	28,923	29,259	28,903	28,375	27,660	27,039	25,675	25,062
Complete EUS Sample	265,276	260,057	254,393	247,540	240,127	234,944	222,184	216,612

Table A2. Jordan Employment and Unemployment Survey Sample Sizes, Years 2007-2014
Working Age Males in Informal Private-Wage Work by Nationality and Treatment Level

	2007	2008	2009	2010	2011	2012	2013	2014
All Jordan								
Jordanians	10,510	10,081	9,764	9,975	9,536	8,964	8,971	8,921
Syrians	173	196	154	158	166	293	596	684
Egyptians	1,602	1,760	1,457	1,556	1,243	1,230	1,058	1,143
Other	465	400	473	456	256	184	178	225
Total	12,750	12,437	11,848	12,145	11,201	10,671	10,803	10,973
Low-Syrian								
Jordanians	2,285	2,150	1,983	1,959	1,776	1,663	1,770	1,709
Syrians	35	39	39	36	40	59	138	150
Egyptians	626	677	577	610	382	489	411	375
Other	132	179	209	202	95	79	77	147
Total	3,078	3,045	2,808	2,807	2,293	2,290	2,396	2,381
Medium-Syrian								
Jordanians	4,012	3,826	3,686	3,769	3,681	3,387	3,231	3,296
Syrians	98	87	62	87	76	140	230	292
Egyptians	550	631	598	605	519	525	445	508
Other	151	92	100	105	68	53	57	47
Total	4,811	4,636	4,446	4,566	4,344	4,105	3,963	4,143
High-Syrian								
Jordanians	4,213	4,105	4,095	4,247	4,079	3,914	3,970	3,916
Syrians	40	70	53	35	50	94	228	242
Egyptians	426	452	282	341	342	216	202	260
Other	182	129	164	149	93	52	44	31
Total	4,861	4,756	4,594	4,772	4,564	4,276	4,444	4,449

Appendix B. Weight Methodology

The EUS data captures the increase of Syrians from 2010-2014, but underestimates their presence. Since I wanted to analyze trends at the governorate level, I wanted a weight that could transform the population composition in the original data to be more reflective of the governorate's actual experience of receiving Syrians. This was necessary to look at compositional descriptive statistics such as share of the labor force by nationality and share of the unemployed by nationality. The methodology for creating the weights is outlined in the following 10 steps. In summary, I used the proportion-Syrian by governorate in the 2004 and 2015 census as parameters for transforming the annual EUS growth rates. Steps 1, 2, 9 and 10 happen in Stata, while steps 3-8 happen in excel.

Step 1. Stratum Weights

Generate a stratum weight in EUS, where the stratum is *nationality, governorate, year* (*n,g,t*) and the weight means to 1 at the stratum level. This stratum weight will be used in Step 9, when the adjusted annualized growth rates are imported into the data set.

$$w\_strata_{i,n,g,t} = \frac{w_{i,t}}{\sum_{\mathrm{n,g=1,1}}^{n,g} w_{i,t}}$$

Stata Code:

```
egen  sumwgt = sum(pweight), by(ethnat_d gov year)
gen stratawgt = pweight/sumwgt
label var stratawgt "pweight / sum of pweights over n,g,t"
label var sumwgt "sum of pweights over n,g,t"
```

Step 2. Weighted EUS Cell Estimates for $S_{n,g,t}$ / S_t

Retrieve population composition estimates from EUS as cell proportions, weighted at the individual (pweight) level. The cell percent shows the ratio of nationality *n* in governorate *g* at time *t* to the total population at time *t.* Import the log file holding these cell estimates into excel. The growth rates in Pr(S) across nationality, governorate and year provide the basis on which the adjusted annualized growth rates are eventually determined.

$$\Pr(S)_{n,g,t} = \frac{S_{n,g,t}}{S_t}$$

Stata Code:

```
log using "EUS_Cells_pweight", text replace
bysort year: tab gov ethnat_d if ethnat_d!=999 [aw=pweight], nof cell
log close
```

Step 3. Census Cell Estimates

Retrieve census population composition, with cell percent showing the ratio of nationality *n* in governorate *g* at time *t* to the total population at time *t,* where *t=2004* and *t=2015.* I pulled this data using tables published on the Jordanian Department of statistics: Housing and Population Census.

$$\Pr(C)_{n,g,t} = \frac{C_{n,g,t}}{C_t}$$

Step 4. Calculate an Adjustment Factor

The adjustment factor is what will force the EUS annual growth rates to pivot, resulting in higher proportion-Syrian by governorate in the post-2011 years. Pivoting the trend line requires that the line is bound by the lower and upper estimates of cell proportions in EUS to the census. The adjustment factor will be the ratio of the lower and upper observations of proportions of nationality *n* in governorate *g* in the census to EUS, raised to the $1/11^{th}$ power. By raising the ratio to 1/11, we convert an 11-year growth rate into an average annualized growth rate that occurs over a period of 11 years. This requires an assumption that the discrepancy in growth between the actual population (census) and the sample population (census) is constant across the years 2004-2014.

$$A_{n,g} = \left[\frac{\Pr(C)_{n,g,2015}}{\Pr(C)_{n,g,2004}} \Big/ \frac{\Pr(S)_{n,g,2014}}{\Pr(S)_{n,g,2003}}\right]^{\frac{1}{11}}$$

Step 5. EUS Adjusted Annual Growth Rates

In this step I calculate growth rates using the cell percents in Step 2 for years 2003-2014 and multiply by the adjustment factor calculated in STEP 4 above. Some cells in this step were not calculable because of such small proportions in EUS - I imputed "1" as a way to maintain a value for comparison. Use the tables retrieved in Step 2 to generate growth rates for each nationality in each governorate from years 2003-2014. Since there is no EUS data in 2004, I estimate a cell proportion for year 2004 as the average between 2003 & 2005.

$$r_{n,g,t} = \frac{\left[\Pr(S)_{n,g,t} - \Pr(S)_{n,g,t-1}\right]}{\Pr(S)_{n,g,t-1}}$$

$$1 + r'_{n,g,t} = A_{n,g} * \left(1 + \frac{\left[\Pr(S)_{n,g,t} - \Pr(S)_{n,g,t-1}\right]}{\Pr(S)_{n,g,t-1}}\right)$$

$$\widetilde{\Pr(C)}_{n,g,2005} = \Pr(C)_{n,g,2004} * (1 + r'_{n,g,2005})$$

$$\widetilde{\Pr(C)}_{n,g,t} = \Pr(C)_{n,g,t-1} * (1 + r'_{n,g,t})$$

Step 6. Interpolate Census Estimates for Years 2005-2014

In this step we start by multiplying the cell percents in each governorate and nationality in Step 4 by the growth rate for year 2005 in Step 5. Thereon, the values up through 2014 are calculated using the previous cell in the table multiplied by the growth rate of the subsequent year in Step 5. The 2015 values are the Census values in Step 3, included for comparison to the results of the interpolation up to 2014.

Step 7. Create an Expansion Factor to apply to EUS $\Pr(S)_{n,g,t}$

In this step we take the cell value from Step 6 and divide by its corresponding cell value (*n,g,t*) from the table in step 2.

$$factor_{n,g,t} = \Pr(C)_{n,g,t} / \Pr(S)_{n,g,t}$$

Step 8. Merge Factors into EUS data

Create a sheet of data to import into Stata with four columns: *ethnat_d, year, gov, pr(c)_ngt, pr(s)_ngt, factor*. This sheet is the contents of the tables in Steps 2, 6 and 7 converted to a long list ordered by the stratum level: nationality, governorate and year. Merge this data set with the EUS master data as a many to 1 (m:1) merge.

merge m:1 ethnat_d year gov using "/Volumes/Brains/Ragui/SRLMJ/Counts_pw.dta", keepusing(cpr_ngt_pw factor_pw spr_ngt_pw) nogenerate

Step 9. Apply Factor to Stratum Weights

Transform the stratum weights with the calculated factors to make a new expansion weight.

$$w\_strata_{i,n,g,t} = \frac{w_{i,t}}{\sum_{\mathrm{n,g=1,1}}^{n,g} w_{i,t}} * S_{n,g,t}$$

$$w\_strata_{i,n,g,t} * factor = \frac{w_{i,t}}{\sum_{\mathrm{n,g=1,1}}^{n,g} w_{i,t}} * S_{n,g,t} * \frac{\Pr\,(C)_{n,g,t}}{\Pr\,(S)_{n,g,t}}$$

$$exp_{i,n,g,t} = \frac{w_{i,t}}{\sum_{\mathrm{n,g=1,1}}^{n,g} w_{i,t}} * S_t * \Pr\,(C)_{n,g,t}$$

Stata Code:

label var cpr_ngt_pw "census proportions (n,g,t) at year t, derived from sample pr_ngt [aw=pweight]"
egen s_t = count(indid), by(year)
*gen sprime_ngt_pw = s_t*cpr_ngt_pw*
*gen exp_ingt3 = stratawgt*sprime_ngt_pw*
*the *stratawgt* here is from Step 1

Step 10. Verify Results

log using "Adjusted_cell_estimates", text replace
bysort year: tab gov ethnat_d [aw=exp_ingt], nof cell

The values from this tabulation should approximately match the interpolated census estimates from Step 6.

Figures